GOVERNMENT OF NORTHERN IRELAND

TENTH ANNUAL REPORT OF THE MINISTRY OF AGRICULTURE

1930-31

Presented to Parliament by Command of
His Grace the Governor of Northern Ireland

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Government House,

Hillsborough,

Northern Ireland,

15*th December*, 1932.

SIR,

I am directed by His Grace the Governor to acknowledge receipt of your letter of 12th December submitting to His Grace the Tenth Annual Report of the work of the Ministry of Agriculture for the year ended 30th September, 1931.

I am, Sir,

Your obedient Servant,

OSCAR HENDERSON,
Commander,
Private Secretary.

The Secretary,

Ministry of Agriculture,

STORMONT.

GOVERNMENT OF NORTHERN IRELAND.

TENTH ANNUAL REPORT
OF THE
MINISTRY OF AGRICULTURE.

To

His Grace, James Albert Edward, Duke of Abercorn, K.G., K.P.,
Governor of Northern Ireland.

May it please your Grace,

I have the honour to submit the Tenth Annual General Report of the Ministry of Agriculture, covering the operations of the Ministry from the 1st October, 1930, to the 30th September, 1931.

The Report is compiled in two sections, the first describing the general conditions of agriculture in Northern Ireland during the year and the manner in which the various Acts and Schemes under the direction of the Ministry were administered, and the second containing a more detailed account of certain features of the work of the Ministry, accompanied by statistical tables.

The outstanding event in Northern Ireland agriculture during the year covered by this report was the regrettable outbreak of foot-and-mouth disease which occurred in County Down in June, 1931. The six counties which comprise Northern Ireland had been free from this disease for more than eighteen years despite the fact that during this period numerous outbreaks had occurred in Great Britain. Consequently when the existence of foot-and-mouth disease in the townland of Ballydugan, near Downpatrick, was confirmed by the Ministry's Chief Veterinary Officer on the 17th June, 1931, the entire efforts of the Ministry were directed towards bringing the position under control at the earliest possible moment and preventing the spread of infection. The shipment of cattle, sheep, goats, other ruminants and swine, from all Northern Ireland ports was immediately suspended and an area having a radius of 15 miles from the town of Downpatrick was scheduled, and all movement of ruminants or swine into, out of, or within this scheduled area was strictly forbidden. An absolute embargo was also placed on the movement of cattle, sheep, goats and swine out of the administrative County of Down and

out of the County Borough of Belfast. Meantime, arrangements were made for the veterinary inspectors of the Ministry to visit every farm in the scheduled area and to slaughter all animals affected by the disease. In addition to the initial outbreak 12 further outbreaks were traced. In every case the animals affected had contracted the disease from the farm on which the initial outbreak at Ballydugan had occurred. It was found necessary to slaughter 508 cattle, 937 sheep, 21 goats and 19 swine as a result of the disease.

Since no further outbreaks occurred it became possible to limit the scheduled area to a radius of approximately 7½ miles from Downpatrick as from midnight the 5th July. The scheduled area was again contracted on the 22nd July, while on the 5th August all restrictions were removed except those placed on the actually infected farms. Between the 17th June and the 4th July the shipment of live stock to Great Britain was entirely suspended but after the latter date fat animals from parts of Northern Ireland outside County Down or Belfast were allowed to be shipped from Northern Ireland ports, with the exception of Belfast, for immediate slaughter within the landing places at the ports of Birkenhead, Cardiff, Glasgow and Holyhead. Normal shipping conditions were restored by stages up to the 22nd August when the Ministry of Agriculture and Fisheries, London, permitted the normal importation of animals, both fat and store, from all Northern Ireland ports under the usual conditions, namely, ten hours' detention in the landing places and six days at the place of destination.

The total cost involved in putting down the outbreak was only £14,500 and the period during which a complete embargo upon the shipment of live stock from Northern Ireland existed was only between two and three weeks. Within just over two months from the date of the original outbreak normal shipping conditions had been restored. It is a matter of deep gratification to the Ministry that the appearance of this cattle scourge in Northern Ireland was so quickly disposed of and that the disorganisation of the important export trade in live animals between Northern Ireland and Great Britain was subject to interruption for a comparatively short period. It may be permitted to recall that outbreaks of foot-and-mouth disease in Great Britain in the past have, in many instances, cost millions of pounds to suppress. The disease in Northern Ireland might easily have spread throughout the whole country and the manner in which it was localised, controlled and exterminated reflects the highest credit upon the Chief Veterinary Officer of the Ministry and his staff.

The sources of infection of foot-and-mouth disease have always

been a puzzle to veterinary surgeons. The numerous outbreaks which have occurred in Great Britain have, in many instances, been particularly disturbing owing to the great difficulties which have been found to exist in tracing the probable source of infection. Immediately the existence of the disease was confirmed the veterinary staff made every effort to trace the source of infection and an exhaustive inquiry with this object in view was made. Two clear facts emerged from this enquiry. In the first place, every case of disease was traced to one farm at Ballydugan. Secondly, on this farm the only apparent source of infection was Dutch broccoli or cauliflower which had been imported through the port of Leith. The refuse from this vegetable was thrown on a rubbish heap to which the cattle at the farm had access.

The economic position of the farming community during 1930-31 showed little improvement as compared with the previous year. The index figure for the principal agricultural products sold off the farms showed little change. In the case of potatoes a welcome increase in price occurred. Farmers realised an average of £4 2s. 6d. per ton for this crop during 1930–31, as compared with £2 5s. od. in the previous year. On the other hand, prices of cattle, sheep and pork all showed declines. There was an increase in the average price realised for poultry but this was offset by a decrease in the price of eggs. The composite index figure for all the principal agricultural products, with the exception of whole milk, was 79.5 in respect of the year 1930–31 as compared with 80.5 in respect of the preceding year. (Base year 1923=100). While, however, there was little change in the general average level of prices of produce sold off the farm there was a fairly substantial decrease in the index figure for the principal agricultural requisites. This index figure fell from 81 in 1929–30 to 61 in 1930–31. (Base year 1923=100). The principal fall was in the price of feeding stuffs, particularly maize meal. A slight decline also occurred in the prices of fertilisers and of agricultural seeds. The cheapness of animal feeding stuffs was an important benefit to our stock farmers and was of considerable assistance in mitigating the effect of the further fall in the prices of cattle, sheep and pork which occurred during the year.

While this report deals primarily with the activities of my Ministry during the period ended 30th September, 1931, I feel that in view of the important developments in connection with the agricultural policy of the Imperial Government which have taken place during recent months, I should make some reference to the effects which this policy is likely to have upon our farmers in Northern Ireland.

In the first place I should refer to the effect upon our agriculture of the decision which was taken by the National Government

at the end of September, 1931, to abandon the gold standard to which the pound sterling had been tied since the beginning of the summer of 1925. During the past few years the effect of the association of sterling and gold had been to bring about a disastrous fall in the prices of our agricultural products. To what extent the depreciation in the value of gold and the consequent fall in prices was due to a maldistribution of the gold resources of the world between different central banks it is not my purpose to discuss. It is, however, at least certain that the fall in prices which had resulted in the index figure of Northern Ireland agricultural produce falling from 115 in the year ended September 30th, 1925, to 79 in the year ended September 30th, 1931—a decline of over 30 per cent.—was primarily due to the association of sterling and gold. I feel, therefore, that the abandonment of the gold standard last autumn was one of the steps which was necessary in order to avoid further injury to the position of the farming community through the continued fall in gold prices. The expectations which were aroused regarding a rise in prices owing to our departure from the gold standard were, however, soon falsified. Certain of our most important competitors, notably Denmark, also took the step of abandoning the gold standard so that their exporters would not be placed in an unfavourable position on the British market on account of the difference in exchange between the value of the British pound and the Danish kroner. Moreover, the fall in gold prices continued and, therefore, the benefit to our farmers came not in the way of higher prices but in the maintenance of existing prices and the avoidance of a further fall.

Of equal importance with the change in the position of sterling has been the adoption of an agricultural policy by the National Government designed directly to foster and improve the position of agriculture. Following the war and the disappointment to the hopes of the agricultural community in Great Britain which resulted from the repeal of the Corn Production Act of 1917 and the Agricultural Act of 1920, the main principles of British agricultural policy have lain in the extension of agricultural research, agricultural credit and the improvement of the methods of marketing agricultural produce. It is true that the policy of subsidising the sugar beet industry was followed, but this solitary instance of direct aid to one limited branch of agriculture only serves to emphasise the fact that the main directions in which agriculture has benefited from Government action have been through the development of research and credit facilities and the improvement of marketing technique. The imposition of a general revenue tariff of 10 per cent. by the Import Duties Act of 1932 has, therefore, been welcomed by the entire agricultural community. It is true that certain classes of agricultural produce have been excluded from the scope of this measure,

notably imports of meat and meat products and imports of cereals. On the other hand, imports of maize and maize products have been admitted free and this policy of free admission for our principal feeding stuff has been of great benefit to our farmers. In the case of cereal products the National Government has adopted the principle of the Quota as a means of benefiting the wheat grower. The Wheat Quota Act of 1932 has been passed with this object in view. So far as our farmers in Northern Ireland are concerned comparatively little benefit will accrue from this enactment, but the agricultural policy of the National Government must be viewed as a whole. The principle of the quota which has already been applied to wheat will, I hope, also be applied to pigs and pig products and is already being applied to beef and mutton as a result of the Ottawa Conference which was held in August. Already the Government has promised to introduce a scheme for the quantitative control of imports of bacon and hams as soon as the organisation of the industry at home is such as to enable the deficiency in supplies which will arise as a result of the limitation of imports to be made up from home production. With this object in view a Reorganisation Commission for Pigs and Pig Products was set up under the Agricultural Marketing Act, 1931, and has recently published its report in which a scheme of reorganisation for the bacon industry is presented. I do not propose to discuss here the degree of reorganisation that will be required in Northern Ireland. It is, at least, certain that a greater degree of agricultural organisation than has already existed in this country will be required of us in the future. I welcome this development. Not alone will a greater degree of organisation enable the industry to take advantage of the Government's proposals for the quantitative control of imports but I feel that it is only by organisation that many of the disadvantages in connection with marketing under which our farmers are at present labouring will be removed. The question of marketing reform is one which has received special attention in recent years. In Great Britain a committee of enquiry into the methods and costs of selling and distributing agricultural, horticultural and dairy produce was appointed in 1922, while in more recent years the whole structure for the marketing of agricultural produce in England and Wales has been reviewed in a comprehensive series of marketing reports. Last year the Imperial Parliament passed an Agricultural Marketing Act designed to enable producers of any agricultural product to join together and to put into operation a scheme for the collective marketing of their product in any area of England and Wales or Scotland or the whole of Great Britain. I have followed these developments across the Irish Channel with the closest attention, for I am convinced that the improvement of marketing methods in our own area is one which calls for urgent

attention. With the aid of a grant from the Empire Marketing Board it has been possible to undertake a comprehensive survey of the principal channels for the marketing of agricultural produce in Northern Ireland and to carry out detailed studies in regard to the marketing of certain of our more important commodities. A report embodying the results of these investigations has recently been published. It reveals that many and serious abuses in connection with the marketing of farm produce exist. I trust that representatives of farmers and of producers generally will co-operate with the Ministry in an investigation into the degree to which it may be possible to remove some of these abuses.

The total expenditure on agricultural services during the year ended 31st March, 1931, including services administered through local authorities, may be summarised under the following heads :

Agricultural Research and Faculty of Agriculture	£18,055
Agricultural Education	46,600
Live Stock Schemes	37,266
Diseases of Animals Acts	25,035
Afforestation	16,633
Flax and Potato Industries	11,277
Marketing of Agricultural Produce	6,643
Grants for Improvement of Agricultural Holdings and for Repair of Damage caused by Floods ..	6,168
Subsidies to Shows	2,198
Improvement of Dairying	1,757
Collection of Agricultural Statistics including the Census of Production	3,235
Ordnance and Geological Surveys	9,610
General Expenses	49,567
Total	£234,044

Apart from a contribution of £7,266 from the Agricultural Development Fund and contributions from local authorities totalling £19,768, the expenditure shown was met from moneys voted by Parliament for purposes of agriculture. The contributions from local authorities comprised :

(*a*) a sum of £10,707 levied by the several County Councils under Section 78 (1) of the Education Act (N.I.), 1923, representing a penny in the pound on local rates ;

(*b*) a sum of £3,631 applied directly by the County Councils towards costs arising under the Diseases of Animals Acts, and

(*c*) a sum of £5,430 levied on the County and County Boroughs for the purpose of the General Cattle Diseases (N.I.) Fund, being the produce of a rate of a farthing in the pound and representing the fourth assessment made since the Fund was created in 1926.

Of the capital sum of £40,000 which comprised the original endowment of the Agricultural Development Fund a balance of £14,455 remained unexpended as at 31st March, 1931. As explained in previous Reports the Fund has been devoted to the extension of live stock schemes including poultry. In the financial year 1931-32, however, the Fund was relieved of any charge in respect of poultry schemes, the additional moneys required for that purpose being provided from the Parliamentary Vote.

In addition to the total of £234,044 finally expended as above described, twenty-two loans for various agricultural purposes, to a total of £1,627, were granted by the Ministry during the financial year. In addition, the schemes of loans by Banks to farmers under Government guarantee continued to operate, loans guaranteed in the period 1st January to 30th November, 1931, amounting to £5,422. Further particulars regarding the various loan schemes are given in Appendix IV.

Agricultural Education.

The comprehensive system of training for the sons and daughters of farmers outlined in the Report for 1929-30 was in operation during the period under review. Winter agricultural classes for the sons of farmers were held at nineteen centres in the six counties during the year covered by this Report. A class arranged at an additional centre fell through owing to unsatisfactory attendance. There was an attendance of 306 students at the nineteen class centres and of this number 165 were awarded certificates. Courses of instruction in agriculture and horticulture were given at all centres, instruction in veterinary hygiene at thirteen centres, and instruction in poultry-keeping at four centres. Details of the centres at which instruction was given and the number of students in attendance at each centre will be found in Appendix III.

The courses of instruction at the Agricultural and Horticultural College, Greenmount, constitute an important part in the Ministry's Scheme of Agricultural Education for young men. Courses of training in agriculture and horticulture are provided at this College which is situated near the town of Antrim. Owing to the fact that a large mixed tillage farm, garden and orchard are attached to the College ample facilities for the practical training of students are available, and the students are enabled to see the scientific principles taught in the class-room put into practical

operation. Forty-four scholarships covering tuition, board, residence and ordinary medical attendance were offered by the various County Committees of Agriculture in connection with the 1930-31 session. Thirty-nine applicants qualified for the award of these scholarships and were admitted to the College in addition to three boys who entered as fee-paying students. Of these forty-two students thirty-eight took out the course in agriculture and four the course in horticulture.

In connection with the advanced course of University training in agricultural science provided by the Ministry at the Agricultural Faculty of The Queen's University, Belfast, six scholarships of the value of £100 per annum, tenable for four years, were awarded as the result of an examination held in October, 1930, at which there were 22 candidates. An additional scholarship provided by The Queen's University from the Gibson Trust Fund was awarded on the result of the same examination. During the year under review there were in the Agricultural Faculty of The Queen's University thirty-nine students, viz., twenty-three holders of Ministry's scholarships, five who had scholarships from the Gibson Trust Fund, one the holder of a scholarship from the Anne Hall Bequest Fund, one the holder of a scholarship provided by a Regional Education Committee and nine who were fee-paying students.

A further scholarship in horticulture offered for competition by the Ministry during 1931 was awarded on the result of an examination held in September at which seven candidates were present. The holder of the scholarship awarded in 1930 successfully completed the first year of his course at Greenmount College and the scholarship which for the second year will be tenable at The Queen's University was renewed by the Ministry. Details of the syllabus of the scholarship course which is designed to afford a thorough practical, scientific and commercial training in horticulture will be found in Appendix III of the Ministry's Annual Report, 1929-30.

Two further scholarships in creamery management, each of the value of £98 : 6s. : od., were awarded by the Ministry in 1931. Thirty-seven candidates attended the examination held in connection with these scholarships. The scholarship course embraces two periods of technical training at the University College, Cork, extending from October to March in successive winter terms, and an intervening period of twenty weeks' practical creamery training, half of which is taken out at the experimental creamery attached to the College and half at a selected creamery in Northern Ireland.

Courses of training in poultry-keeping, butter-making and rural housewifery for girls are provided at the North-West School,

Strabane, and the Ulster Dairy School, Cookstown, and four terms are held each year at each of these schools. In the case of the North-West School 24 places and in the case of the Ulster Dairy School 50 places are available each term.

In connection with the North-West School free scholarships are provided by all the Committees of Agriculture in Northern Ireland for girls resident in their respective counties, and during the year ninety-one places at the School were filled by holders of such scholarships. While the course at the North-West School is in the main intended for girls who propose to return to their homes, many of the girls on completion of their course at the School proceed to the Ulster Dairy School for further training. During the year 1931 thirty-seven North-West students entered the Ulster Dairy School for additional training.

During the year covered by this Report one hundred and ninety-eight places were filled at the Ulster Dairy School. Notwithstanding this the demand for training at the school is so extensive that there is a very lengthy waiting list of applicants seeking admission. Forty-six pupils qualified for certificates in all subjects during the year and three girls successfully completed the prescribed course of training at the School for persons desirous of qualifying for the position of itinerant instructor in poultry-keeping and butter-making and proceeded to the twelve months' course of training at an approved poultry farm in Northern Ireland which has to be taken out before final recognition can be granted. Four other pupils at the School qualified for the award of creamery apprenticeships by means of which girls who desire to become dairymaids in creameries are afforded an opportunity of obtaining practical training in creamery work with a view to obtaining the necessary qualifications for the award of the Ministry's Certificate of competency in butter-making.

During the year both the Ulster Dairy School and the North-West School were visited by parties from Milk Recording Associations, branches of the Ulster Farmers' Union and also by pupils from winter agricultural classes and poultry-keeping classes. The number of such visitors to the Ulster Dairy School was about 350 and to the North-West School about 250.

In addition to the provision for the instruction of sons and daughters of farmers as outlined in the previous paragraphs, schemes of instruction in agriculture, horticulture and poultry-keeping and butter-making are in operation in each county, and through the media of lectures, visits, etc., by the instructors employed under these schemes the most up-to-date information in regard to farming problems is conveyed to the farming community. Under the scheme of instruction in agriculture ten instructors and sixteen overseers are employed by county com-

mittees of agriculture. During the year 5,453 farms were visited by the instructors and 78 lectures were delivered, and 15,279 farms were visited by the overseers. One hundred and sixty-four field experiments were carried out by the instructors and 2,388 demonstration plots were laid down by the instructors and overseers. The carrying out of experiments and demonstrations is a most important section of the Ministry's agricultural educational work inasmuch as the results of these experiments bring home to the farmers from a practical point of view the advantages to be gained in the direction of increased yields through proper manuring, use of suitable seed varieties, and the cultivation of suitable varieties of crops. 627 wild white clover plots and 598 phosphatic manure plots were laid down by the instructors and overseers as demonstrations in connection with the improvement of pasture, and the major portion of the expenditure on these plots was defrayed from a Special Development Grant. A considerable amount of live stock experimental work was also undertaken by the instructors. Baby beef experiments to determine the comparative values of two mixtures of cakes and meals were carried out at six centres in the counties of Armagh, Down and Tyrone. Calf feeding experiments to test the results of different rations were carried out at three centres in the counties of Londonderry and Tyrone, and in addition a comparative experiment with calves fed for stores and calves fed for beef and finished on grass was carried out at one centre in County Tyrone. Pig feeding experiments to investigate the efficiency of certain substitutes for separated milk were carried out at six centres in the counties of Antrim, Down and Tyrone, while one experiment to compare Large White Ulster pigs, Large White York pigs and a first cross between Large White York and Large White Ulster pigs for bacon production was carried out at one centre in County Tyrone. Demonstrations relating to the cost of rearing suckers until the weaning stage were carried out at seventeen centres in the counties of Fermanagh, Londonderry and Tyrone.

It is estimated that the annual loss to cattle owners in the British Isles caused by the warble grubs is approximately £1,000,000. This loss is of a two-fold nature, first, the failure of the animals to thrive as they otherwise would owing to the irritation caused by the grubs, and second, the actual damage to the hides owing to their being punctured by the grubs. During the year experiments were carried out on 25 farms, on which almost 300 animals were treated, to test the efficiency of a preparation for destroying the warble grubs. In these experiments the preparation used killed 97 per cent. of the warbles present.

The various county committees of agriculture employ ten instructors in connexion with the scheme of instruction in poultry-keeping and the main object of their work is the improvement of

poultry-keeping in Northern Ireland through the medium of classes and lectures and by visiting farmers with a view to giving practical instruction and assistance when desired. During the year these instructors paid 7,126 visits to poultry-keepers and delivered 63 lectures. Ten courses of instruction at which 178 pupils attended were also conducted. Further useful work is carried out by the poultry instructors in connexion with the Poultry Stations Scheme which enables poultry-keepers, especially those in backward districts and those engaged in the poultry industry in a small way, to obtain from established poultry stations sittings of eggs from high grade stock at a reasonable price. A limited number of premiums are awarded by the several county committees of agriculture to persons selected to keep hen, or hen and duck, and goose stations for the distribution of hatching eggs. Premiums are also awarded in respect of established turkey stations at which hen turkeys may be mated with male birds of high grade stock. The work in connexion with the establishment of the stations, the selection of suitable stock birds and the blood-testing of station stock for bacillary white diarrhoea is carried out by the poultry instructors. Details of the operations of the scheme will be found in Appendix III.

The Ministry has also an arrangement with five up-to-date poultry farmers whereby in return for a subsidy particulars as to the working, expenditure, and receipts in connection with each of the farms are furnished annually to the Ministry. These poultry demonstration farms have been specially selected in order to indicate the commercial possibilities of poultry-keeping on up-to-date lines. Three of the farms are also utilised as training centres for pupils from the Ulster Dairy School who wish to qualify for posts as instructors or teachers in poultry-keeping. A maintenance allowance is granted to each pupil during the poultry farm course which is of twelve months' duration.

The butter-making scheme operates in combination with the poultry-keeping scheme in Counties Antrim, Armagh, Down, and Londonderry, and has for its main object the provision of advice and practical instruction in all matters dealing with butter-making and home cheese-making. The manufacture of butter is carried on principally at creameries in the remaining two counties (Fermanagh and Tyrone) in which the scheme does not operate. Details of the operations of the scheme will be found in Appendix III.

Nine instructors are employed in connexion with the scheme of instruction in horticulture and bee-keeping which operates in all six counties in Northern Ireland. These instructors paid 7,544 visits during the year under review and delivered 123 lectures. In addition, 283 demonstration plots and vegetable

plots were laid down and experiments on the control of apple scab, manuring apple trees, manuring black currant bushes, apple thinning, black currant mite and control of cabbage root fly maggot were carried out. Details of the operations of the scheme will be found in Appendix III. The instructors in horticulture are also responsible for the work of judging in connexion with the apple orchard competitions, which are held under the auspices of the Ulster Horticultural Society, and the cottage prizes competition which is held in counties Antrim and Fermanagh. Their services are also utilised in organising exhibits to be staged at agricultural shows.

The scheme of subsidies to agricultural societies, etc., is designed to assist those societies which are established for the purpose of holding agricultural or horticultural shows, ploughing matches, etc. A table setting out the number of shows held, the amount paid in subsidies, etc., will be found in Appendix III. Unfortunately five shows had to be cancelled owing to the outbreak of foot-and-mouth disease which occurred in County Down in June and July.

Agricultural Shows continue to be a feature of Northern Ireland during the summer months and the more important of these were used as media for staging educational exhibits. The principal Show is that of the Royal Ulster Agricultural Society held on four days during the last week in May, and at this Show the Ministry staged, as usual, a comprehensive exhibit, the object of which was to provide useful information to producers and exporters of agricultural commodities. A descriptive account of this will be found in Appendix III.

Research.

The furtherance and development of agricultural research within Northern Ireland has continued to be one of the most important branches of the work of the Ministry. The conditions of agricultural depression with which our farmers were confronted during the year covered by this Report constituted a challenge to farmers, research workers and officials to endeavour to readjust the methods by which agricultural production in Northern Ireland is carried on so as to meet the changed economic conditions confronting the industry. Unfortunately there is a great deal of misconception in regard to the functions of the research worker and the assistance which research can render to agriculture in a time of depression such as we are experiencing at present. Farmers see that prices are falling and that difficulty is experienced in disposing of the agricultural produce which is available for sale. Whatever the cause of the depression, whether it be due to monetary factors associated with the shortage of gold, to the erection of tariff

barriers constituting hindrances to the free flow of trade and the exchange of goods, the influence of high taxation in crippling industry, or the bounty of nature which has resulted in abnormally high yields being obtained in the case of certain crops, the effect of the depression as seen by the farmer is to bring about a surplus of produce which can only be absorbed by the market at a lower level of prices. To the average farmer the agricultural crisis appears to be due to over-production. Of what value, therefore, are the efforts of the research worker to make two blades of grass grow where only one grew before? Is there not already more produce being produced than can be disposed of at a remunerative level? Surely what is required is that there should be a restriction of production so as to enable prices to rise once more to a higher and more profitable level. With this object in view farmers and their representatives have urged upon the Government the restriction of the free importation of agricultural produce from abroad either by tariffs, by quotas, or in some cases even by an actual embargo. The policy advocated by many farmers to-day is, in fact, the creation of a shortage.

I readily admit the disastrous consequences which a large —and in some cases even a small—surplus of produce beyond the requirements of the market may have in bringing about a sharp fall in prices. I hope that in the near future farmers in Northern Ireland will be enabled so to organise the arrangements for the marketing of their produce that they will be able to prevent the flooding of the market by large supplies of surplus produce and the consequent undercutting of prices which ensues. But it is a mistake to believe that the object of agricultural research is simply to enable the farmer to produce more produce—its object is rather to assist the farmer to produce more profitably by eliminating waste and disease and by improving the efficiency with which farming operations are carried on. I recognise that the benefits of research work of this character, leading to an improvement in farming technique, may not all accrue to the farming community. In the long run it is the consumer who benefits through the fall in prices which results from increased and more efficient production. In order to obtain the full benefits of research discoveries the farmer must be quick to apply them before they have passed into the ordinary day to day usage of the farming practice of the country. If he delays to apply the new methods they will become a source of actual injury to him because when they have become generally adopted by his neighbours he will be producing by old methods that are costly, obsolete and inefficient while prices will be governed by the cost at which produce can be raised by the new methods which have come into vogue with their greater efficiency and lower cost. What is true of individuals is equally true of nations. For

agricultural production is international in character and those countries which are the first to adopt new methods and to apply the lessons of research are the countries in which the prosperity and welfare of the agricultural community is likely to be greatest. It is for this reason that I have provided for the creation of various research divisions in Northern Ireland so that our farmers shall have available the latest knowledge with regard to the best treatment for those crops and stock which are common to our farming conditions here. It is in a time of depression, when competition is keenest, when profits from ordinary everyday farming are hardest to obtain, that the application of some of the lessons of research may make all the difference between profit and loss. Unfortunately it not infrequently requires the sharp spur of a period of depression to make farmers realise that their farming is backward and that the old traditional methods of their fathers are no longer adequate for success in agriculture to-day. All too often a farmer who realises that he is losing money by the old methods, jumps to the conclusion that what is required is a reduction in his expenditure and a decrease in the degree of intensity of his farming operations. He has heard that " High farming is no remedy for low prices " and he thinks that he will improve his chances of earning a profit by curtailing his outgoings. If, to commence with, that farmer is already farming his land to the best advantage and up to the margin of profitableness—in fact up to the point where, after he has applied all the lessons of research, the tendency to diminishing returns is still operating—then it may be that the proper course for him to pursue is to lower the standard of his farming. But how many farmers are there in Northern Ireland who are in this position ? It does not require a great knowledge of Northern Ireland to realise that on very many farms the methods of husbandry have not been pushed to the margin of profitableness. A short time ago the Ministry published the results of certain financial accounts which had been collected from a number of farms in the province. One of the outstanding features of these financial accounts was the simple fact that those farms which showed the best results—where the farm income was greatest—were those upon which expenditure and receipts were both above the average. The best results were shown by those farms which were well stocked, which had a high expenditure per acre, but which had also correspondingly high receipts per acre. I am confident that at the present juncture the best policy for the great majority of farmers in Northern Ireland is to farm as well and as intensively as they can and to make all practical use of the new knowledge regarding such matters as the nutrition of poultry, the rationing of baby beef and the feeding of cows for milk production, the manuring of grass land, or the control of diseases of fruit trees which is becoming available.

I do not propose to enter upon a detailed discussion of the work of the various research divisions. An account of the progress of that work will be found in Appendix I of this Report. I wish, however, to refer to the publication of Volume III of the Journal of this Ministry which took place recently. A perusal of this volume will indicate the practical results which are being achieved by the research divisions and I commend the Journal to all farmers who wish to develop their farms to the best of their ability in these anxious and difficult days.

Live Stock.

The importance which is attached by my Ministry to the development of the live stock industry is well known. Sales of live stock or of live stock products constitute the great bulk of the sales of produce off the farms of Northern Ireland, while in Great Britain we are fortunate in having a market which can readily absorb all the produce of this character which it is possible for us to produce. In these circumstances the Ministry has inaugurated a large number of schemes designed to foster the live stock industry of Northern Ireland in all its branches. The progress made under these schemes during the year 1930-1931 is reviewed in the following pages.

Horse Breeding Scheme.—This scheme was again in operation in each county in 1931, and followed the lines of that in force in 1930, the only change being that each thoroughbred stallion, to earn a premium, was required to serve 30 mares during the season, instead of 20 as in previous years. The annual exhibition of stallions was held in February, 18 Thoroughbreds and 32 Clydesdales being shown. All these animals, with the exception of one Thoroughbred, were regarded as up to premium standard. As in previous years lists of eligible stallions in order of merit were issued to county committees who selected all but seven Clydesdales and two Thoroughbreds from the lists. Premiums were also given to three half-breds, one in County Antrim, one in County Down, and one in County Fermanagh, while an Irish Draught Stallion which had stood for several years in County Tyrone was again selected for the award of a premium in that county. The Register of Stallions was published giving particulars of the 44 stallions standing for premiums.

Three loans were granted during the season for the purchase of stallions. One of these was a Thoroughbred and the other two were Clydesdales. The Thoroughbred was located in County Tyrone and the Clydesdales in counties Down and Fermanagh. In addition to loans the purchasers of the stallions were given subsidies equal in the case of the Thoroughbred to two-thirds of the purchase price and in the case of the Clydesdales to half of

the purchase price. Each purchaser was required to bind himself to keep the animal for the period of the loan, viz., five years, in the district in which it had been located.

In addition to the normal regulations under the horse breeding scheme, Londonderry County Committee made a regulation requiring the owner of a mare being offered for service to hand to the owner of the stallion, prior to the service of the mare, a veterinary surgeon's certificate that the mare was sound. The County Committee of Agriculture for Down made a regulation that the stallion must stand for service at a market town in the county at least one day each week during the season. These were the only special regulations made by county committees.

Details of the operations of the scheme will be found in Appendix III.

Cattle Breeding Scheme.—The aim of this scheme is to promote improvement in cattle breeding by inducing bull owners to keep suitable and sound sires of a high degree of excellence. The fundamental feature of the scheme is the award of premiums for selected bulls, and farmers who have been chosen by the respective county committees to keep premium bulls attend at the appointed centres to procure animals that have been passed by the Ministry's inspectors as up to the required standard. Bulls of the following breeds are eligible for premiums :—Shorthorn, Registered Dairy Shorthorn, Registered Dairy Non-Pedigree Shorthorn, Aberdeen Angus, Hereford and Galloway, but bulls of the Galloway breed are not eligible for premiums if placed in a locality outside the eastern mountainous area of County Antrim. The value of a premium varies in accordance with the breed of bull selected. In the year under review the maximum value of a premium payable was £20—this premium was paid in the case of a registered dairy Shorthorn bull with milk records on both sire and dam's sides, but if milk records were kept only on the dam's side the premium payable was £17. For a pure-bred Shorthorn, Aberdeen Angus or Hereford bull a premium of £15 was paid and for a registered dairy non-pedigree Shorthorn bull or Galloway bull the value of the premium was £13.

Two annual spring shows and sales are recognised as centres for the selection of first year premium animals, namely, the spring sale held at Balmoral under the auspices of the Royal Ulster Agricultural Society, and the spring sale held at Londonderry under the auspices of the North-West of Ireland Agricultural Society. If applicants so desire, however, the Ministry offers no objection to premium bulls being procured at the spring sale held annually at Ballsbridge under the auspices of the Royal Dublin Society. As a rule a certain number of applicants who are selected to keep Aberdeen Angus bulls procure animals of this

type at the Dublin Show. In addition, the annual sale of Galloway bulls held at Cushendall was an approved centre for the supply of premium bulls of this breed to the selected applicants in the prescribed area in County Antrim. In future it has been arranged that Galloway bulls for premiums will be selected at the show and sale held at Ballymena by the County Antrim Agricultural Association, instead of as heretofore at Cushendall.

The inspection of bulls with a view to the award of continuation premiums is carried out at the end of the year at local centres fixed by the Ministry, due regard being paid to the convenience of the premium holders. On an average the bulls are awarded a premium for three successive seasons and in special cases—particularly dairy bulls—premiums are granted for a longer period if the animals have proved fruitful and have passed the local inspection. The Ministry is glad to observe that the practice of retaining premium bulls that are breeding well is extending.

During the year under review 43 " special term " bulls were located on easy terms with farmers in the poorer districts of each county, the cost of these animals being defrayed from the Agricultural Development Fund.

Details of the operation of the scheme will be found in Appendix III.

Registration of Dairy Cattle.—This scheme is intended to encourage breeders to keep reliable milk records and to mate their best milkers with high-class dairy bulls and by this means to endeavour to raise the standard of dairy cattle throughout the country. The Ministry has consistently endeavoured to convince farmers that systematic milk recording is essential to successful dairy farming and the success of its efforts may be gauged from the fact that the scheme continues to interest a greater number of breeders each succeeding year.

This scheme is directly controlled by the Ministry and inspections are carried out twice each year. The chief feature of the scheme is the keeping of registers by the Ministry in which pure-bred animals of any dairy breed and their progeny may be entered subject to their attaining the stipulated registration standards. Cows that are of good conformation and well defined type are provisionally selected and put under test, and the first 45 weeks after calving are regarded as the milking period for the purposes of the scheme. At the end of this period owners submit the milk record sheet of each animal to the Ministry for calculation and, if it transpires that the cow has attained the requisite registration standard in respect of quantity and quality of milk, entry in the register is effected, always provided that the animal has calved again within 14 months from the date of previous

calving. Officers from the Ministry visit from time to time the farms where recording is taking place in order to ensure that the records are being properly kept and also to take milk samples which are sent to the Ministry's Chemical Research Division for analysis for butter-fat content.

A register on the same basis is also kept for non-pedigree dairy cattle. Cows of this type, however, are tested through milk recording associations and the animals which as a result of such test qualify for registration in respect of milk yield and butter-fat and comply with the requisite calving conditions are duly registered.

An additional incentive to farmers to keep milk records of their cows is provided by the fact that the male progeny of registered cows which are either pure-bred Shorthorns or non-pedigree Shorthorns are eligible to compete for the premiums offered under the Ministry's cattle breeding scheme, and consequently higher prices are generally obtainable for such bulls at the approved spring shows and sales. During the period under review 252 bull calves, the progeny of registered Shorthorn cows, were so inspected, and 104 were provisionally selected for premiums under the cattle breeding scheme. Of this number 44 were pure-bred animals with dams and sires registered ; 26 were pure-bred with dams only registered, and 34 were non-pedigree animals with approved milk records on one or both sides. In addition, 34 bulls, the progeny of pure-bred Shorthorn cows, were inspected at owners' residences and passed as suitable for the service of provisionally selected and registered Shorthorn cows.

In order to preserve the continuity of the pure-bred dairy cattle records and to present them for public use in permanent and accessible form the Ministry publishes the data from time to time. During the period under review the Ministry issued a booklet containing the registrations of pure-bred dairy cattle effected during the year ended 31st December, 1929, and this publication was offered for sale at the low price of 4d. per copy. Previous to this publication two volumes of the Register had already been put on sale—Vol. I and Vol. II covering the periods 1st January, 1922, to 31st December, 1923, and 1st January, 1924, to 31st December, 1928, respectively. These volumes cost only 1/- each and copies can be obtained from H.M. Stationery Office, 15 Donegall Square West, Belfast, or through any bookseller.

Details of the operations of the scheme during 1930-31 will be found in Appendix III.

Milk Recording Associations.—These associations are a very important factor in the Ministry's general scheme for raising the

standard of dairy cattle in Northern Ireland. Farmers are now coming to realise that it is only by the systematic keeping of milk records that they can distinguish between the profitable and unprofitable cows in their herds, and the local associations provide popular media through which testing can conveniently be effected. During the year interest in this progressive movement was well maintained and two additional associations were established, bringing the total number of associations up to 74 with a membership of 2,876 and 15,605 cows under test. There were no material changes made in the scheme during the year and the normal association activities were carried out by supervisors in a creditable manner.

Swine Breeding Scheme.—The swine breeding scheme which was again in operation in each county is on similar lines to the cattle breeding scheme. The main feature of the scheme is that county committees of agriculture are empowered to grant premiums to small farmers, selected by the committees, who purchase pedigree boars of the Large White Ulster and Large White York breeds, which have been passed as up to premium standard by the Ministry.

The premium payable in respect of both first-year and second-year boars is £9 except in counties Londonderry and Tyrone where the first-year premiums are £10 and £8 respectively and the second-year premiums £8 and £6 respectively. To earn the premium the animals are required to serve from 30 to 40 sows at a service fee varying from 2/6 to 5/-. At the end of the first season boars are inspected with a view to determining their suitability for premiums for a second year. All such boars must show a high degree of excellence, and animals which show signs of having been badly cared for are not selected ; moreover, the owner of the boar selected for a second-year premium must produce evidence of the fruitfulness of the boar in the preceding year.

Sheep Breeding Schemes.

(*a*) *Blackface Sheep Scheme.*—In a hilly country like Northern Ireland it is natural that there are large areas devoted solely to the raising of blackface sheep. There are, of course, certain large flock owners, but the majority of the sheep are the property of small owners who possess common mountain grazing rights. The Ministry's mountain sheep scheme aims at raising the standard of blackface sheep and the means adopted is the distribution of well-bred rams on easy terms to small owners. The rams are selected by the Ministry on behalf of county committees of agriculture who sell the rams at reduced prices to selected applicants in mountain districts. Each applicant is required to sign an undertaking to keep the ram for at least two years in good and healthy condition, and at the end of that period the ram is, as a

rule, sold to a breeder in another district. The scheme is in operation in every county except County Fermanagh and progress was well maintained during the year under review. In the general working of the scheme the Ministry co-operates closely with the Ulster Ram Breeders' Association, and in addition to giving an annual grant—this year a grant of £50 was provided —it recognises the sales held annually in Belfast in the autumn under the Association's auspices as centres for the selection of premium rams. The great majority of the rams located under the scheme are procured at these sales, but in addition it has been found advisable to introduce fresh blood by importing each year a number of high-class rams from Scotland.

The county committees continued the practice of organising small sheep shows at which the exhibits consisted mainly of the progeny of the premium rams placed out under this scheme.

(*b*) *Lowland Sheep Scheme.*—With the object of improving sheep breeding in lowland districts the scheme providing premiums for pure-bred rams was continued with successful results during the season, and as County Fermanagh participated for the first time the year under review was the first season in which all counties had the scheme in operation.

Speaking generally, the scheme is conducted on similar lines to the various premium schemes which aim at fostering improvement in livestock breeding. The rams are selected at one or other of the autumn sales held in Belfast under the auspices of the Ulster Ram Breeders' Association, and premiums are granted only to such shearling rams of the approved breeds as are entered or eligible for entry in the flock book of the breed. It will be observed from the tables in Appendix III setting out the operations of the scheme that the great majority of the rams placed out are of the Border Leicester breed. The maximum value of each premium is £8, but with a view to the conservation of funds all committees, except Londonderry, have decided to reduce the premium to £7 or £6. To earn the premium each ram must serve not less than 30 and not more than 40 ewes during the season, the maximum service fee chargeable being 2/- per ewe. A ram may be awarded a second and also a third premium, provided that it passes inspection each season by the Ministry, but a third-year premium is granted only to those rams which are of outstanding merit.

Goat Breeding.—From the standpoint of the small holder and the cottager goats are a useful class of stock. The type of animal to be found is, however, often capable of much improvement and it was with this object in view that the Ulster Goat Society was inaugurated.

The Society has in operation a stud goat scheme under which male goats with good milking pedigrees are distributed and premiums of £2 are granted to the owners of these animals provided they fulfil certain regulations laid down by the Society. The Ministry is fully alive to the beneficial work that is being accomplished and co-operates with the Society to encourage the milk recording of goats by keeping a register in which are entered particulars of those goats which give a calculated yield of not less than 900 lb. of milk in a lactation period not exceeding forty-five weeks. In this connection it may be noted that the Ministry furnishes the British Goat Society with particulars of all animals which, as the result of a test, have been accepted for entry in the Ministry's Register of Goats on a milk yield of 1,000 lb. or over, and particulars of such animals appear in the milk recorded section of the British Goat Society's herd book.

During the period covered by this Report the normal grant of £50 was made by the Ministry to the Society, and, in addition, a supplementary grant of £10 was made to enable the Society to purchase two stud goats.

Marketing.

During the year under review four Acts dealing with the marketing of agricultural produce in Northern Ireland were either placed on the Statute Book or came into operation. The Marketing of Dairy Produce Act (Northern Ireland), 1929, came into force on the 1st January, 1931. As was explained in the Ninth Annual Report of this Ministry for the year 1929/30 the intention of this Act is to provide for the registration of all premises upon which cream is separated from the milk delivered by a number of suppliers or upon which butter is manufactured, blended, or assembled for export; to prescribe conditions under which the manufacture of butter shall be carried on at these registered premises, and the markings to be applied to packages of butter for export. Under the provisions of the Act 77 Auxiliary creameries, 33 Central creameries, 4 butter factories and 7 wholesale depots were registered by the Ministry. As a condition of registration it was found necessary, in the great majority of cases, to insist upon certain improvements being effected either to the premises or to the equipment for the manufacture of butter or separation of cream. It is gratifying to record that the management of practically every Central or Auxiliary creamery from whom it was necessary to require an undertaking to carry out improvements as a condition of registration complied with the Ministry's requirements speedily and with the minimum of delay. In only two cases were creamery committees obliged to obtain loans from the Ministry to carry out the improvements which

were necessary, the total amount of the loans granted being £1,100. As a result of the operations of the Act during the first year of its working it may be claimed that the great majority of creameries in Northern Ireland are now equipped with an adequate and efficient plant for the handling of butter and cream. In a few instances it was necessary to defer the carrying out of all the improvements required until a later date, but within twelve months of the coming into operation of the Act it had proved possible to grant full registration in respect of the bulk of the Auxiliary and Central creameries in the Province. A detailed account of the operations under the Act will be found in Appendix II.

The Marketing of Eggs Act (Northern Ireland), 1931, received the Royal Assent on the 26th May, 1931, and came into operation on the 1st September of that year. The passage of a further amending Act to the code of legislation dealing with the marketing of eggs, which now extends from 1924 to 1931, may appear to require special explanation. The circumstances leading up to the decision of the Ministry to introduce the Marketing of Eggs Act, 1931, may be briefly described. The principal Act, which was passed in 1924, may be said to have represented the pioneer movement in connection with the compulsory marking and grading of agricultural produce within the United Kingdom. The effect of that legislation was immediately apparent in the improvement which resulted in the quality and reputation of our eggs and in the enhanced price which they were able to command upon the British market. The operation of the Merchandise Marks Order, 1928, under which all eggs imported into the United Kingdom had to be stamped upon the shell with an indication of the country of origin also operated to enhance the price of Northern Ireland eggs which, along with eggs produced in Great Britain, continued to be sold unmarked. In 1929 the National Mark Scheme was introduced by the Ministry of Agriculture and Fisheries in England. Under the operation of this scheme the best home produced eggs on the British market came to be sold under the National Mark label, and it was found that these eggs, although constituting only a small proportion of the total supply of home produced eggs sold in Great Britain, were commanding a higher price than Northern Ireland graded eggs. As a consequence the tendency was for Northern Ireland eggs to be relegated to a position somewhat comparable with that obtaining for ungraded British eggs. Meanwhile steps had been taken in the principal near-by continental countries exporting eggs to Great Britain to improve the quality of their eggs. Danish and Dutch eggs in particular, although requiring to be marked on the shell with the country of origin, were yet found to have established for themselves a high reputation for quality. In these circum-

stances it is regrettable to have to record that Northern Ireland eggs were failing to maintain for themselves the place on the British market which they had established following the passage of the Marketing of Eggs Acts, 1924 to 1928, and of the Merchandise Marks Order, 1928. The extent to which the reputation of our eggs had fallen in Great Britain was reflected in lower prices being paid to producers in Northern Ireland. In this connection the following table showing the index numbers of prices of eggs in Northern Ireland and in Great Britain from 1923 to 1930 is of interest. In each case the base year is 1923.

	Northern Ireland.	England and Wales.
1923	100 ..	100
1924	100 ..	100
1925	104 ..	101
1926	94 ..	90
1927	89 ..	86
1928	89 ..	87
1929	92 ..	95
1930	78 ..	81

It will be observed that up to 1929 the prices of eggs in Northern Ireland were maintained at a higher level than in Great Britain but that in and after that year the position was reversed. During the summer of 1930 it was found that among cases of eggs presented for shipment at the docks in Northern Ireland there were a considerable proportion of eggs of second quality. It became apparent that a great many of the faults which were being discovered in our eggs were due to indifferent methods of production on the part of poultry-keepers throughout the Province and also to the delay which occurred in handling eggs through their passage from one dealer to another. After discussions with representatives of the egg trade the conclusion was arrived at that, particularly during the summer months, a large proportion of the eggs received from poultry-keepers were of poor quality. The main reason for this indifferent quality seemed to be the presence of fertile eggs and the practice of washing the eggs on the farm. A more intensive degree of education among poultry-keepers as to the best methods of producing eggs thus appeared desirable. Representatives of the egg merchants recognised that an extension of the Ministry's educational activities amongst egg producers would involve a considerable increase in expenditure and agreed to the principle that this expenditure should be defrayed through an increase in the fees charged for egg licences. Accordingly an amending Bill was prepared and a series of meetings arranged at various centres throughout the six counties to which each egg licence holder was invited. The meetings were well attended and unanimous approval was given to the pro-

posals for the amending Bill. A summary of the principal provisions of the Marketing of Eggs Act (Northern Ireland), 1931, will be found in Appendix II. It is sufficient to say here that the principal effect of the Act has been to require the payment of an annual licence fee of £3 from each Class A licence holder, that is from every egg dealer who sells eggs tested, graded and packed, and of an annual fee of £1 from every Class B licence holder, that is from every egg collector. In addition a fee of ½d. per case (360 eggs) is charged on all eggs despatched to Great Britain, the Irish Free State or the Isle of Man. Unless specially exempted all licensed egg dealers are now required to test eggs. In cases where exemption from testing is given a collector is required to dispose of his eggs within three days from the date of collection to a dealer who tests.

As a result of the increased revenue which has been derived by the Ministry from the higher fees imposed by the 1931 Act it has been possible to employ an increased staff of marketing instructors who are actively engaged among egg producers throughout the whole country.

The Marketing of Fruit Act, 1931, received the Royal Assent on the 26th May. This Act follows broadly the provisions of earlier marketing legislation and requires that all merchants exporting fruit to Great Britain or the Isle of Man must be licensed and pay an annual fee of £1 and must grade and pack fruit exported by them in accordance with certain prescribed conditions. Growers may receive permits free of charge which allow them to export fruit grown by them to Great Britain or the Isle of Man provided that such fruit is graded up to the same standards as apply in the case of licensed dealers. The regulations in regard to grading apply only in respect of the export trade, but all packages of fruit whether for sale within Northern Ireland or for export must not be "topped." In this way it is hoped that an end will be put to a practice which has done serious harm to the reputation of Northern Ireland fruit through packages of fruit being sold containing an upper layer of fruit of good quality which, however, concealed a quantity of inferior fruit beneath.

The fourth Act dealing with the marketing of Northern Ireland produce which came into force during 1931 was the Agricultural Produce (Meat Regulation) Act (Northern Ireland), 1930. Under the terms of this Act licences to export fresh meat have been issued to 40 persons who have made arrangements for the slaughter of animals on registered premises where examination by a veterinary surgeon is carried out both before and after slaughter. Licences to carry on the business of curing bacon and hams have under the Act been granted to 97 persons.

Reference was made in the Report for 1929/30 to the enquiries

which during the past three years have been conducted into the methods of marketing Northern Ireland agricultural produce. As has already been mentioned, a report embodying the results of these enquiries has recently been published. This report contains detailed studies of the marketing of cattle, pigs, fat and store lambs, poultry and turkeys. It has been an object of the report, however, to survey not merely the conditions of marketing individual commodities but also the general structure and organisation which exists for the sale and disposal of farm produce from the time it leaves the farm until it reaches the wholesale merchant or exporter. This aspect of the problem is dealt with in an introductory section of the report. Certain recommendations and suggestions have been made while it is hoped that the report will provide a basis of discussion in regard to the whole question of the improvement of marketing organisation in Northern Ireland.

Throughout the year the Ministry continued to provide an up-to-date and reliable service of market information for the guidance of farmers and others interested in the sale of agricultural produce. A statement giving the prices and quantities of agricultural produce sold at certain of the most important markets in Northern Ireland during the previous week is issued each Monday evening. A supplementary report dealing with the prices of potatoes is also issued during the export season. Reports of transactions at the more important live stock fairs in the country continued to be issued regularly during the year, together with a weekly report giving particulars of the prices realised for stock at the Belfast Auction Marts. The Monthly Report of the Ministry contains a review of the progress of farm work and of agricultural conditions generally throughout the previous month. Notes are also embodied in this Report upon the work which should be performed on the farm during the coming month, advising farmers regarding the economical use of feeding stuffs, summarising the prices of live stock at fairs and the trend of markets during the previous month, and giving statistics of the important exports of live stock and some of the principal classes of agricultural produce. Information regarding the current prices of farm requisites—feeding stuffs, fertilizers and seeds—is also published in the Report.

Most of the information contained in the monthly Report and in the Weekly Produce Statement is reproduced in the Press and the Ministry is greatly indebted to the editors and proprietors of newspapers in Northern Ireland for assistance in connexion with the circulation of information of interest to farmers.

In addition to the general publications referred to above the

Ministry circulates specialised information to limited groups of producers or traders regarding the position of the products in which they are interested. Arrangements have also been made with the British Broadcasting Corporation to broadcast a Bulletin of agricultural market prices for farmers from the Belfast station. Since the 31st August, 1931, this bulletin has been broadcast daily (except Sundays and Saturdays) at 5.55 p.m.

General.

The second census of the agricultural production of Northern Ireland was taken in respect of the year 1930-31, and arrangements were made for the collection of the additional particulars required. The annual collection of statistics relating to crops and live stock is carried out each June by members of the Royal Ulster Constabulary, and the services of members of that force were largely utilised to obtain the particulars necessary to enable an estimate of the output of agriculture in the year 1930-31 to be made. Owing to the interval that occurs between the time of the actual planting of farm crops and the time of their disposal final estimates relating to the agricultural output have to be delayed until data is available regarding the prices realised for crops and other produce during the year of the census. A considerable mass of statistical information relating to the enquiry has been collected during the past year but owing to pressure of other work it has not been possible to make much progress in collating the information. In connexion with the census and in conjunction with the Ministry of Agriculture and Fisheries for England and Wales and the Board of Agriculture for Scotland an enquiry was made regarding the number of live stock in Northern Ireland at the 1st January, 1931. This was the first occasion upon which particulars regarding the number of live stock in any part of Ireland have been collected in respect of a winter month. A comparison between the numbers of stock in the summer—when numbers are normally at their maximum—and in the winter—when numbers are normally at their minimum—may be expected to provide valuable information regarding the breeding of stock and the principal periods for the disposal of stock off farms. The opportunity of the winter census was also availed of to obtain particulars regarding the areas devoted to catch cropping in 1930-31.

The Fifth Annual Report upon Agricultural Statistics was prepared during the year. In addition to the normal features of this report the fifth issue contained a section dealing with the financial results of a number of farms in respect of which accounts were kept during the year. These accounts had been collected in connexion with an enquiry into the economic position of small farms in Northern Ireland which is being conducted with the aid

of a grant from the Empire Marketing Fund. It is hoped that this scheme of account keeping among farmers will lead ultimately to the collection of a volume of material which will provide a means of estimating the profitableness of farming in Northern Ireland from year to year.

The third volume of the Journal of the Ministry was also prepared during the year. This publication embodies the results of the principal research work conducted by the research staff of the Ministry during the period which has elapsed since the issue of Volume II of the Journal in 1929.

The year under review saw the transference of the offices of the Ministry to the new Government buildings at Stormont.

I have the honour to be,

Your Grace's faithful servant,

E. M. ARCHDALE,
Minister.

James S. Gordon,
Secretary.

Ministry of Agriculture,
Stormont,
Belfast.

12*th December*, 1932.

APPENDIX I.

REPORTS ON THE WORK OF THE RESEARCH DIVISIONS OF THE MINISTRY.

		Page.
1.	Chemical and Animal Nutrition Division	31
2.	Seed Testing and Plant Disease Division	34
3.	Plant Breeding Division	41
4.	Animal Diseases Division	44
5.	Poultry Division	46
6.	Crop and Animal Husbandry Division	48
7.	Dairy Bacteriology Division	51
8.	Special Potato and Flax Experiments	53
9.	Special Horticultural Experiments	55
10.	Ulster Dairy School Farm	56
11.	North-West School Farm	57

APPENDIX I.

CHEMICAL AND ANIMAL NUTRITION DIVISION.

During the past year by far the greatest number of enquiries received by the division were connected with feeding questions and in particular those problems dealing with poultry nutrition. It is obvious from these enquiries that farmers realise the economic advantages of sound nutritional practice and are anxious to make full use of the results of recent experimental work.

POULTRY.

The work on the nutrition of poultry reported last year was continued and the experiments were mainly confined to further investigations as to the relative importance of the various ingredients in the mineral mixture used hitherto.

CHICKEN REARING.

Previous feeding experiments with the rearing of chicks had shown that the absence of chlorides of sodium and potassium from the mineral mixture caused a considerable depression in the rate of growth. In an experiment conducted in 1931 it was demonstrated that there was no comparable depression in the growth rate in the absence of sodium chloride and potassium chloride when potassium and sodium were included as bicarbonates. In another group where sodium chloride was substituted for the mixture of sodium chloride and potassium chloride good growth results were obtained. These results indicate that sodium and/or potassium are at least as essential as chlorine.

The results of another experiment showed that no impetus to growth in chicks resulted from the addition of extracted soya bean meal to a cereal ration, whereas the addition of a mineral mixture of sodium chloride and potassium chloride to the latter ration gave as good results as the addition of the " complete " mineral mixture.

The results of a third experiment which was designed to ascertain whether any benefits accrued from the addition of various supplements to a cereals plus separated milk ration showed no benefits for the addition of a small proportion of iron ammonium citrate or the addition of 5 per cent. of extracted soya bean meal. The addition of 5 per cent. of extracted soya bean meal together with salt did, however, increase the rate of growth to a small extent. This was most noticeable in the earlier stages.

Last year it was reported that the absence of sodium and potassium chlorides from the mineral mixture was accompanied with very serious losses. An experiment on somewhat similar lines was conducted this year. It was found that there was no diminution in the rate of growth when iron oxide, sulphur, potassium iodide and potassium chloride were omitted from the mineral mixture and, further, that the use of sodium chloride (the remaining ingredient of the " complete " mixture) as the sole mineral supplement to the mash gave as satisfactory or slightly superior results to the " complete " mineral mixture. It should be noted that in all the rearing experiments the birds had crushed oyster shell *ad lib.*

The results of the experiments noted above indicate that in addition to lime—derived from oyster shell—common salt appears to be the only mineral substance which is likely to be lacking under normal conditions of farm practice.

In 1930 a rearing experiment was carried out to compare various methods of feeding and management. It was found that birds could be satisfactorily raised indoors to the onset of laying if 2 per cent. of good quality codliver oil was included in the mash. At the conclusion of the rearing period the birds from the intensive and non-intensive groups were placed in the laying pens and both groups fed on the same standard mash. The egg yields and mortality figures indicate that the intensively reared birds lacked stamina. Repetition of the experiments will be necessary before the results may be regarded as conclusive.

LAYING EXPERIMENTS.

The experiments with laying birds, in which the relative importance of the ingredients of the mineral mixture has been examined, have given results similar to those obtained with the feeding of chickens. It was found with pullets that provided lime was supplied (as oyster shell) no response was obtained for the addition of steamed bone flour, iron oxide, sulphur or potassium iodide. On the other hand, the omission of sodium chloride and potassium chloride brought about a very serious reduction in number and size of eggs and, further, signs of cannabalism were evident amongst the birds in frosty weather when they could not utilise their runs. Further experiments on the same lines have given similar results.

EGGS.

Officers of the division have co-operated in an experiment designed to determine the factors governing the keeping quality of eggs. An apparatus has been elaborated to determine the shell strength of eggs and records of these strengths are being made in the case of eggs from birds on different rations and under different conditions of management. When sufficient data has accumulated it will be possible to trace the effect, if any, of the strength of shell on the keeping quality of eggs.

During the past two years laboratory experiments have been in progress on the subject of the calcium and phosphorus requirements of pullets. A satisfactory technique for determining the calcium and phosphorus balance has been developed, and eight balances have been completed : each balance covers the period immediately prior to laying and the initial period of laying. This work concludes the first part of the present investigation ; it has been established that egg laying is coincident with a temporary, discontinuous, and rather heavy negative phosphorus balance, and that the voiding of calcium tends to a uniform low level during laying. Certain other observations made during this work suggest that pullets receiving a normal laying ration including a large proportion of wheat offals do not require significant amounts of a phosphorus supplement, such as steamed bone flour, in their ration. It is also believed that certain recent estimates of the normal calcium requirements of non-laying hens are shown by this work to be somewhat high.

A paper describing the results of this investigation has been prepared for publication.

PIGS.

Facilities for work on pig nutritional problems is, at the moment, rather limited. It has been possible, however, to carry out two experiments at Hillsborough in which one litter of pure-bred Large White York pigs and one litter of first cross Large White York and Large White Ulster pigs were fattened on similar rations. Records of performance were kept and samples of the fat from individual pigs were examined for quality. It was found that there was little variation in the quality of fat from litter mates. Further experiments on the same lines will be conducted and the results used to interpret the results from other experiments on the factors controlling quality.

SOIL AND FERTILIZERS.

LIMING.

The experiments on this problem already reported are being continued. Further trials were laid down during the past year and the records of crop yields and the mineral composition of certain of the crops are being made throughout a complete rotation.

POTATO MANURIAL EXPERIMENTS.

These experiments were designed to ascertain the most efficient mixture of nitrogen, phosphate and potash for the potato crop. The experiments have been concluded and the results published in detail elsewhere. The results obtained show that the standard mixture as recommended by the Ministry, *i.e.*, 1 cwt. sulphate of ammonia, 4 cwt. superphosphate, 1 cwt. muriate of potash, gave higher yields than any other combination of these manures.

During recent years a new type of fertilizer has appeared on the market. These fertilizers are mixtures of chemicals, designed to supply the most suitable proportions of nitrogen, phosphoric acid and potash, for particular requirements, in the smallest possible bulk. In such fertilizers materials other than nitrogen, phosphoric acid and potash make up a smaller proportion of the whole than was the case in simple mixtures of the fertilizers usually met with in practice. The relative merits of

the Ministry's standard mixture (" 1–4–1 ") and one of these newer concentrated fertilizers are being examined in a carefully designed field trial. The results of this experiment are not yet available.

QUALITY OF POTATOES.

A large number of nitrogen determinations were made on the tubers from several of the commoner potato varieties, with a view to finding whether or not nitrogen content was connected with (1) cooking quality and/or (2) manurial treatment. It was found that nitrogen content was greatly influenced by the locality in which the potatoes were raised and this figure could not be used as an index of cooking quality. Nitrogenous manures had only a very slight and rather indefinite influence on the nitrogen contained in the potatoes.

RECLAMATION OF BOGLAND.

The manurial treatment necessary for potatoes grown on freshly broken bogland is at present the subject of an investigation by this division. By the courtesy of an agricultural firm in County Armagh it has been possible to undertake this work on a field scale.

The bog, after suitable preparation, received a heavy dressing of pig manure and a small dressing of lime. The larger portion received a dressing of the standard potato mixture. On a smaller experimental area, only part of which received lime, various fertilizer mixtures were tested. All the plots gave very satisfactory yields and the work must be continued before any definite recommendation can be made.

METHODS FOR THE DETERMINATION OF THE MANURIAL REQUIREMENT OF SOILS.

This subject has been engaging the attention of agriculturists generally during recent years. A number of special methods have been developed on the Continent, particularly in Germany, and experiments are being conducted by this division in order to see if one of these methods (Mitscherlich's) is applicable to Irish conditions. The method is based on a special pot culture technique. Soils from five centres were tested during the past year, and it is hoped to check the results by means of field trials in the coming season.

ANALYTICAL WORK.

Work on some of the problems of soil analysis has been undertaken in co-operation with the Agricultural Education Association.

MILK TESTING.

The analytical work in connection with the Milk Recording Scheme of the Ministry has been maintained. With the advent of two new associations, 1,668 additional samples were tested. The number of reports issued to farmers during the year was 19,514.

THE CAUSES OF VARIATIONS IN THE YIELD AND COMPOSITION OF MILK.

The statistical work in connection with this investigation is still proceeding. A preliminary report dealing with the influence of the season of the year and the influence of temperature on yield and composition has been submitted. The report shows that variations in the butterfat percentage are due mainly to variations in the milk yield, and that the season of the year exerts a marked influence on the percentage of solids-not-fat. During periods of high temperature the percentage of solids-not-fat is depressed. The influence of temperature on the percentage of butterfat is shown to be comparatively insignificant. Diurnal variations in temperature had a slight effect on the morning percentage of butterfat but not the evening percentage of butterfat. The main part of the investigation, namely, the suitability of the existing legal standards for butterfat and solids-not-fat, will be completed at an early date.

THE EFFECT OF THE SIRE ON THE MILK YIELDS OF PROGENY.

Data in connection with this investigation are still being collected. It will be necessary to await the completion of the 1931 lactations before a report can be submitted. Every effort is being made to bring the data up to date in order that prepotent bulls may be identified before slaughtering.

SHEEP.

The experiments with the feeding of mineral cubes to mountain ewes were continued at two centres. The results obtained were satisfactory and the experiments are being continued and further trials were commenced this year at three new centres. Sheep farmers are watching these experiments with considerable interest.

ANALYTICAL WORK.

The division continued to carry out the analytical work required by the various schemes of the Ministry. In co-operation with the Dairying Division a large number of samples of butter and cream were examined, and assistance was given on numerous occasions with the examination of samples of eggs taken in connection with the Marketing of Eggs Acts.

TEACHING.

The normal programme of teaching in the Department of Agricultural Chemistry of the Queen's University of Belfast was carried out by the staff of the division. On several occasions during the year evening lectures were delivered to branches of the Ulster Farmers' Union in various parts of the Province.

PUBLICATIONS.

The Influence of Stage of Lactation on the Natural Acidity of Milk.—J. Houston. Journ. of Dairy Res., Vol. II, No. 2, May, 1931.

Investigations during 1928 and 1929 into the Effects of Flax Water on Fish Life.—J. C. Baird and W. Duff. Journ. of Min. of Agric. N.I., Vol. III, 1931.

Potato Manurial Experiments.—J. C. Baird. Journ. of Min. of Agric. N.I., Vol. III, 1931.

The Rationing of Baby Beef.—R. H. Common. Journ. of Min. of Agric. N.I., Vol. III, 1931.

Notes on the Fattening of Surplus Cockerels.—J. H. Prentice and R. G. Baskett. Journ. of Min. of Agric. N.I., Vol. III, 1931.

The Role of Separated Milk, Soya Bean Meal and Minerals in the Nutrition of the Chick.—J. H. Prentice and R. G. Basket. Journ. of Min. of Agric. N.I., Vol. 3, 1931.

Recent Progress in Poultry Husbandry. The Role of Vitamins and Minerals.—J. H. Prentice. Agricultural Progress, Vol. VIII, 1931.

Nutritional Factors Influencing the Growth of Chickens.—R. G. Baskett. Journ. of Min. of Agric. N.I., Vol. III, 1931.

Carotene and Vitamin A. The Conversion of Carotene into Vitamin A. by Fowl.—N. S. Capper, I. M. W. McKibbin and J. H. Prentice. Biochem. Journ. Vol. XXV. No. 1.

SEED TESTING AND PLANT DISEASE DIVISION.

A number of research activities initiated during the past eight years are now bearing fruit and it is gratifying to report that improved methods arising therefrom are definitely passing into practice with visible commercial results. The undertakings of the division have reached their economic maximum in volume, and such earlier experiments as can be considered completed are being discontinued so as to admit of new enquiries. The pathological work and, to a lesser extent, the agronomical activities of the division have hitherto been handicapped by the want of a full time worker upon insect pests. This lack has recently been met by the appointment of an agricultural zoologist and it is anticipated that this will very greatly enhance the value of the other sections of the division, as well as providing for additional much needed research of a purely zoological nature.

Seed Testing.

The total number of samples tested during the season 1930-31 was 3,230, representing a slight decrease on the figure for the previous year. The total was made up as follows :—

From wholesale and retail merchants	68	per cent.
„ farmers and co-operative societies	5	„
„ Ministry's official samplers	8	„
„ officers of public departments	19	„

The proportions received from wholesale and retail merchants and from farmers and co-operative societies show decreases, while those from Ministry's official samplers and from officers of public departments show corresponding increases. The increase in the latter class is chiefly attributable to experimental tests undertaken

in connection with maturity of ryegrass, and analysis of ryegrass strains by filtered ultra-violet light, which are referred to under the section "Research and Advisory Service."

An analysis of the various species groups tested is presented in Table I.

TABLE I.

Analysis of samples tested.

Kind of Seed.	Percentage of Total.	Percentage increase (+) or decrease (—) in number of samples received as compared with previous year.
Ryegrass	73	—19.6
Other Grasses	8	+ 4.3
Flax	3	+43.1
Clovers	10	+18.8
Cereals	2	+12.9
Roots, Vegetables, &c. ..	4	—26.7

It will be observed that ryegrass continues to constitute the vast bulk of the samples examined. The decrease in the number of ryegrasses in relation to the previous year's total is probably due to the season being an exceptionally good one for Irish grown grasses, making the necessity for testing less obvious. The high quality of the season's seed will be seen from the following table, which gives the averaged results of the year's purity and germination tests for the more important species, with corresponding figures for previous years.

TABLE II.

Purity and Germination Results from the more important species for season 1930-31.

	No. in Average	PURITY.					GERMINATION.			
				Injurious weeds. No. of samples containing:		No. of samples containing Ergot.				
		Mode %*	Average %	over 1 %	over 2 %		Mode %*	Average %	Average Hard Seed %	Average of mode for seasons 1923–1930 %*
Perennial Ryegrass	1,027	99	97.0	–	68	21	93	88	–	86
Italian Ryegrass	492	99	96.1	–	36	13	90	85	–	83
Mixed Ryegrass	174	99	96.0	–	10	11	82	84	–	82
Crested Dogstail	86	–	96.2	–	0	6	94	88	–	–
Red Clover	86	–	96.9	0	–	2	–	85	4	–
White Clover	24	–	95.5	1	–	0	–	81	7	–
Wild White Clover	56	–	97.2	1	–	0	–	84	6	–
Alsike Clover	48	–	94.3	0	–	2	–	88	5	–
Flax	74	–	96.8	0	–	0	92	88	–	90
Timothy	26	–	99.3	–	0	5	–	94	–	–
Cocksfoot	42	–	91.9	–	0	0	–	90	–	–

*NOTE.—The "modal" figure is that which occurs most frequently in a series. Thus in Table II. perennial ryegrass shows a germination of 93 per cent. more frequently than any other figure. The "mode" thus reflects the general quality of seed obtainable more accurately than does the "average."

The purity and germination figures in Table II. refer to tests conducted on the "Continental" system. Only some 60 requests for "Irish" tests were received. It will be seen that the quality of ryegrasses was particularly good, the figures given being the highest on record for this station. The following comparison of average and modal germination figures for the past eight seasons is instructive.

TABLE III.

Average and modal germination percentages for Ryegrasses for seasons 1923-24 to 1930-31.

Season.	Germination Percentages.					
	Perennial.		Italian.		Mixture.	
	* Mode	Average	* Mode	Average	* Mode	Average
1923–24	88	86	86	86	83	81
1924–25	84	79	78	80	80	85
1925–26	90	84	87	82	87	80
1926–27	90	84	89	83	87	81
1927–28	83	83	78	78	—	87
1928–29	82	82	77	75	74	75
1929–30	82	79	85	83	78	79
1930–31	93	88	90	85	82	84
Average for eight seasons	87	—	84	—	82	—

* See Footnote to Table II.

It will be observed that both perennial and Italian gave a modal germination figure for the season 1930–31 outstandingly better than in any previous year. Mixed ryegrass on the other hand did not show any improvement over the average for the seasons under review.

The clovers were somewhat lower in germination and flax higher than in previous years. Cocksfoot and Timothy samples maintained their usual high standard of quality.

An increased number of control samples, drawn by the Ministry's Inspectors on vendors' premises, was tested. The general quality of these lots was satisfactory.

RESEARCH AND ADVISORY SERVICE.

It is regarded as a very good sign that advice, when sought and given, is acted upon to an increasing extent; evidence that this is the case is becoming plentiful and one of the natural results of it (since it argues that advice is being found useful) is a reflex increase in the volume of advisory work demanded. Enquiries received during the year covered a great variety of subjects, but as usual the bulk of them were with regard to the treatment of grassland, seeds mixtures and weeds. It is noteworthy that a very large increase in the number of enquiries in connexion with weeds has developed since the promulgation of results of trials with a non-poisonous weed-killer referred to in an earlier report.

Commercial Grass Seed Production.—During the last decade it has become more and more evident that the "strain" (that is, the exact genetical constitution) of herbage plants is of as great importance as in the hitherto more widely understood case of cereals. The recognition of this, together with the expanding area and importance of grassland, has resulted in a rapidly augmenting demand among purchasing countries for "pedigree" grass seeds. It has thus become increasingly evident that the grass-seed trade of Northern Ireland cannot be indefinitely maintained in its present position of world dominance unless the stocks in commercial use are examined and the production of seed from the best herbage types instigated. Ryegrass seed stocks throughout the world are, at present, very mixed as to type, our own among them, and it will take a considerable term of years to reduce the heterogeny of types now being grown in any country to order. It appears urgent that we

should be among the first in this field and the division has, therefore, gone into collaboration with the Crop and Animal Husbandry and Plant Breeding divisions for the purpose of developing a scheme having the object of placing our grass-seed trade upon a purity-to-type basis. The difficulties in the way of any such scheme are numerous and formidable, but it is confidently felt that they can be overcome.

The first necessity in any such scheme is to set up a method by which individual plants, or individual seeds, or crops, can be judged. Hitherto, in order to determine the pasture value of a ryegrass plant it has been necessary to grow it in the field for several seasons. During the past year the method developed by the division for distinguishing types by the use of screened ultra-violet light, referred to in the last report, has been pursued vigorously and has given results of the first importance. Comparison of judgments based on this test and occupying three weeks, with field results obtained from the same seed stocks in another country by field trials extending over two to three years, has shown practically 100 per cent. agreement, and there is every reason to think that the use of this test on an extended scale among our commercial stocks and among new selected varieties (establishment of which is among the aims of the scheme in hand) will very materially reduce the time necessary for the elaboration of stocks of desired types.

Meantime the method has already produced results of considerable commercial value in connexion with the seed, at present on the market, of ryegrass produced in New Zealand. New Zealand produce is of a very mixed character and while certain stocks are of a first class pasture type many others are practically valueless for permanent turf. It has been shown by the ultra-violet method that seed of these stocks can be distinguished with a considerable degree of precision ; a paper on this matter has been published.

In furtherance of the same scheme breeding trials in the greenhouse and in the field were continued and further light was obtained upon the genetics of the fluorescent response to ultra-violet light. A report upon this subject has been published and the experiments are being continued. Meantime, steps are being taken to examine the possibility of establishing a strain, or a number of strains, of ryegrass indigenous or habituated to wild or old pasture conditions in Northern Ireland. In view of the success which is attending the use of so-called " indigenous " strains in other parts of the British Isles and elsewhere, as a primary step, a collection as extensive as possible of ryegrass types from the oldest pastures of the province is being accumulated, with the assistance of the county instructors in agriculture. This collection will be grown in the field for the purpose of observation and selection.

Experiments, referred to in earlier reports, to determine the optimum stage at which to harvest ryegrass crops for seed, were repeated and expanded. They have continued to show that, from the germination point of view, cutting at a stage earlier than the normal does not injure the seed but tends rather to improve its value. During the past year a series of carefully controlled cuttings, made at regular intervals from the period of fertilization until the seed was dead ripe and fallen from the straw, has shown that the field observations previously noted are well founded. In the experiments in question a quite definite gentle fall in germination value took place in the periodic harvestings from 11th July to 1st August (normal harvest for the season in question was about July 20th to 30th). These results are regarded as important in view of the improvement in hay and in the subsequent pasture resulting from early cutting. The apparent disadvantage of early cutting lies in the light bushel-weight of the resultant seed. In order to determine whether, in practice, this was any disadvantage, farm-scale trials were laid down last year in several districts, using seed cut about ten days before normal harvest in the previous season, seed harvested from the same crop but at the normal period being sown for comparison on adjacent plots. So far these plots show no difference whatever in sward formation, vigour, or winter-hardiness as between the fully ripe and the immature seed.

Herbage Experiments.—The competition plots and clover variety trials mentioned in previous reports were continued. The wild white clover comparisons have shown consistently better results from British seed than from New Zealand seed. A paper embodying the results of these trials has been published and the experiment will be discontinued. The remaining trials are as yet immature but there is evidence that, among the red clovers, British strains of an indigenous type are preferable, under our conditions, to foreign varieties. Observation of the competition plots

up to date suggests that the average mixture used for hay and pasture frequently loses value through the inclusion of too much ryegrass, especially Italian ryegrass, and confirms the general opinion that wild white clover has no first year hay value under our conditions.

Weeds.—Further experiments were conducted in the use of sodium chlorate as a farm weed-killer and practically all trials were successful. This material appears particularly well suited for the destruction of thistles, nettles, docks, bindweed, and coltsfoot. Trials are in hand of methods for employing it against rushes and woody species, such as gorse.

COUNTY EXPERIMENTS.

1. *Lucerne.* Trials to determine the value for the Province of lucerne when aided by inoculation of the seed with cultures of root-nodule forming bacteria have been laid down, in collaboration with the instructors in agriculture in each county, and rather more elaborate trials, to compare results from inoculated and non-inoculated seed, and to observe the comparative success of two selected varieties of the crop, have been placed at agricultural institutions and schools. These trials are remaining down for several years. First year observations on the crops suggest that lucerne can be grown if the seed is properly inoculated but that it is unlikely, in view of the difficulty of keeping it clean, to be a profitable undertaking.

2. *Ryegrass.* In conjunction with the county instructors further experiments were conducted to ascertain the optimum seeding of perennial and Italian ryegrass when grown for seed. Results so far to hand suggest that in the case of perennial the gross monetary return is practically the same, on the average, from three rates of seeding—light, medium, heavy—so that a light or medium seeding is probably preferable to a heavy, in view of the ill-effect of the latter upon the other sown species. Other experiments in which the assistance of county instructors was sought have been referred to earlier.

PROFESSIONAL ASSOCIATIONS.

The Seed Testing Station again submitted reports to the International Seed Testing Association upon referee samples circulated by the Executive of the Association and also participated with satisfactory results in the referee work organised by the Ministry of Agriculture and Fisheries.

The Head of the division attended the sixth Congress of the International Seed Testing Association and presented a paper upon the use of screened ultra-violet light in Seed Testing and also served upon a technical advisory committee for the Ministry of Agriculture and Fisheries.

Plant Diseases.

ADVISORY SERVICE.

A further increase in advisory work is recorded for the year 1930–31. In all, 203 cases were investigated and reported upon. This figure shows an increase of 28 (16 per cent.) on the figure for the previous year. More keenness was shown by those making the enquiries and in many cases proof was obtained of considerable benefits which had accrued to farmers, fruit-growers, and others who had made practical application of the advice given. The cases dealt with included all agricultural and horticultural crops (potatoes, cereals, flax, fruit, vegetables, forest trees and decorative plants).

In connection with this advisory service it may again be stated that farmers and fruit growers who are faced with plant disease problems may, upon application, obtain advice regarding their diagnosis and control. This advice is given free of any charge. Typical specimens of diseased plants in a fresh condition should, if possible, be submitted with the letter of enquiry which should contain any information likely to be of use in the investigation.

RESEARCH.

FIELD EXPERIMENTS.

Through the courtesy of the Trustees of the Agricultural Research Institute, Hillsborough, Co. Down, extra facilities have been granted for the carrying out of field experiments in connection with the investigation and control of diseases of

agricultural crops. A statute acre of land has been granted for this purpose and a hut erected thereon to do service as a field laboratory. The Trustees have also made provision for the supply of the necessary labour. These extra facilities should help considerably the work under review.

POTATO DISEASES.

Ordinary or Late Blight (*Phytophthora infestans*, de Bary).

A full account of the experimental work carried out at the Agricultural Research Institute in order to compare the value of dusting the crop with a fungicidal powder with that of spraying with a recognised mixture (bluestone and washing soda) was published in Volume III of the Journal of the Ministry of Agriculture, N.I.

Work is being continued in connection with the determination of varietal susceptibility and the methods by which tubers become infected in the field.

Pink Rot (*Phytophthora erythroseptica*, Pethybridge and Murphy).

Further field trials in connection with the control of this disease were carried out during the year on the farm in County Antrim where severe outbreaks were noted during past seasons. These experiments have included (a) a study of varietal susceptibility in the field, (b) an investigation into the possibility of control by partial sterilization of the soil, using chemical methods, and (c) an attempt to overcome the disease occurring in the " pit " by employing improved methods of " pitting " and by dusting the tubers at the time of " pitting " with a fungicidal powder. Further progress has been made in the laboratory study of the disease and satisfactory results were obtained from the " Pink Rot " survey carried out in 1930.

FLAX DISEASES.

Seedling Blight (*Colletotrichum lini* (Westerd.) Toch., and Browning (*Polyspora lini*, Lafferty).

Experiments carried out at the Agricultural Research Institute to determine the value of seed disinfection in controlling these seed-borne diseases of flax did not give satisfactory results, but it is hoped to carry out further work on this problem.

OAT DISEASES.

Seed-Borne Diseases.

Loose Smut of Oats (*Ustilago avenae*, (Pers.) Jens.)

Closed Smut of Oats (*Ustilago Kolleri*, Wille.)

Leaf Spot (*Helminthosporium avenae*, (Bri. and Cav.) Eid.) &c.

The work in progress at the Agricultural Research Institute with the object of determining the relative values of different methods recommended for seed treatment in connection with the control of the above diseases was extended during the year. Samples of seed of various varieties and likely to be heavily contaminated with disease were obtained from different centres in Northern Ireland and submitted to disinfection treatments. The disinfectants used included formaldehyde and two organic mercury compounds. Full results have not yet been obtained but there is every indication that the results obtained during 1929 and 1930 will be confirmed. At the end of this season this work which has been in progress for the past three seasons will be written up for publication in the Ministry's Journal.

In collaboration with the county instructors in agriculture field trials laid down with the object of comparing the crops obtained from untreated and treated seed are being carried out in each county.

Work dealing with the susceptibility of oat varieties to smut diseases and the effects of (a) methods of sowing, (b) times of sowing, and (c) seasonal factors on the incidence of seed-borne diseases is in progress.

Leaf Spot (*Helminthosporium avenae*, (Bri. and Cav.) Eid.).

Observations on the occurrence of this disease in the field were carried out during the season and further laboratory investigations were made.

Grey Leaf (non-parasitic disease).

Observations made in County Down have indicated that the failure of the oat crop on certain farms in particular seasons may be due to the occurrence of this disease. A series of experiments dealing with the control of this disease has been commenced on a farm where it is suspected of having caused an almost complete failure of the oat crop in some seasons.

STERILITY.

This malady causes serious loss of crop in the case of some varieties and observations as to its occurrence were made during the year.

FRUIT DISEASES.

American Gooseberry Mildew (*Sphaerotheca mors-uvae*, Schw. Berk.)

A full account of the work carried out from 1927–1929 was written and published in Volume III of the Ministry's Journal.

Apple Scab (*Venturia inaequalis*, Aderh.).

Summer spraying for the control of apple scab was carried out generally during 1931 and this operation has now been adopted by apple growers as a routine measure. The season was as treacherous as any since 1923 and very careful spraying, with accurate timing of the applications, was needed in order to keep the disease well under control. Growers possessing motor driven spraying machines and consequently able to speed up the operation managed to spray up to six times during the season. Such a programme fully justified itself during 1931 and resulted in the production of clean fruit.

Manurial experiments designed to indicate whether the susceptibility of apples to apple scab depends in any way upon the system of manuring employed have been carried out in a County Antrim orchard since 1929. Interesting results with regard to manuring and (a) susceptibility to scab, (b) hardness of fruit, (c) colour of fruit, were obtained in 1930. Samples of the fruit were submitted to the Department of Botany, Imperial College of Science, London, and work is in progress in the London laboratories with the object of gaining wider information concerning the composition of the apple and its susceptibility to fungal attack in general, besides obtaining confirmation of the field results obtained in County Antrim. These experiments were extended largely in 1931 and in collaboration with the Chemical Research Division a complete soil analysis of the orchard has been undertaken.

The whole of the experimental work which has been carried out during the past nine years has been conducted in commercial orchards and results far exceeding expectations have been obtained. There is, however, a limit to the type and scope of the work which can be carried out under these conditions and this limit has been almost reached. The work which has been done has not only shown how the results of modern research may be applied and put to successful and profitable use by the farmer, but it has indicated the possibilities of further research and opened up an avenue of problems which could undoubtedly be tackled with success were better facilities afforded.

WINTER SPRAYING.

An account was published in Volume III of the Ministry's Journal giving the results obtained in 1929 from comparative tests of tar distillate washes.

Leather Rot of Strawberries (*Phytophthora sp.*).

This disease of the strawberry fruit has been prevalent in the strawberry plantations of Cornwall during the past few seasons. A fruit rot occurring in a plantation in County Armagh was reported by the Chief Horticultural Inspector during the season and after investigation proved to be Leather Rot. The causal fungus has been isolated, records have been kept, and it is intended to keep the matter under close observation.

FOREST TREE DISEASES.

The control of diseases and weeds in the forest nursery.

A complete account of the work carried out up to the end of 1929 in connection with this problem has been published in Volume III of the Ministry's Journal. The new series of experiments commenced in 1930 to compare the relative merits of sulphuric acid and aluminium sulphate for this purpose were continued in 1931.

Mycological Survey of Northern Ireland.

Since 1923 a carefully compiled record has been kept of fungi (parasitic and saprophytic) which have been noted as new to Ulster. An annotated list of these new records for Northern Ireland has been published in the Proceedings of the Royal Irish Academy. This list adds 311 species and 9 varieties to the fungus flora as it stood at the end of 1922.

DEMONSTRATIONS.

An exhibit illustrating work in progress in connection with the control of fruit diseases was staged at the Chrysanthemum Show of the Ulster Horticultural Society in the autumn of 1930. Progress made in Northern Ireland for 1923–1930 with regard to the investigation and control of plant diseases was the subject of an exhibit staged at Ballsbridge, Dublin, in connection with the Bicentenary Celebrations of the Royal Dublin Society held in June, 1931. In October, 1931, a general exhibit of plant pathological interest was staged at the Annual Conversazione of the Belfast Naturalists' Field Club.

TEACHING.

All senior officers of the division conducted classes in the Department of Agricultural Botany of the Queen's University of Belfast.

Extra-Mural Lectures were delivered to Seed Trade Associations, to local branches of the Ulster Farmers' Union, to Scientific Meetings of the Royal Dublin Society, the Royal Irish Academy, the Belfast Natural History and Philosophical Society, and the Belfast Naturalists' Field Club, as well as a number of public lectures under the auspices of the Belfast Museum and Art Gallery.

PUBLICATIONS.

A Method of Distinguishing certain strains of New Zealand perennial ryegrass (*Lolium perenne L.*) by examination of seedlings under screened ultra-violet light. —P. A. Linehan and S. P. Mercer.

Scientific Proceedings of the Royal Dublin Society, Vol. 20 (N.S.) No. 7, May, 1931. Also abstracted in the Seed Analysts' Bulletin, No. 19, October, 1931.

Experiments on the diagnosis of species and varieties of *Lolium* by the Gentner screened ultra-violet light method.—S. P. Mercer and P. A. Linehan.

Sixth International Seed Testing Congress, Wageningen, Holland, 1931.

Wild White Clover Varieties.—S. P. Mercer and D. Clouston.

Journal of the Ministry of Agriculture (*N.I.*) Vol. III, 1931.

Creeping Thistles.—S. P. Mercer.

Journal of the Ministry of Agriculture (N.I.) Vol. III, 1931.

The Control of American Gooseberry Mildew in N. Ireland. Part II.—A. E. Muskett and E. Turner.

Journal of the Ministry of Agriculture (N.I.) Vol. III, 1931.

The Control of Ordinary or Late Blight of the Potato in Northern Ireland—I. Spraying versus Dusting—Further Experiments.—A. E. Muskett and H. Cairns.

Journal of the Ministry of Agriculture (N.I.) Vol. III, 1931.

Tar Distillate Washes and the Winter Spraying of Apple Trees.—A. E. Muskett and E. Turner.

Journal of the Ministry of Agriculture (N.I.) Vol. III, 1931.

The Control of Diseases and Weeds in a Forest Nursery.—A. E. Muskett.

Journal of the Ministry of Agriculture (N.I.) Vol. III, 1931.

Contributions to the Fungus Flora of Ulster.—A. E. Muskett, E. N. Carrothers and H. Cairns.

Proc. Royal Irish Academy, Vol. XL. Sec. B. May, 1931.

PLANT BREEDING DIVISION.

This season was altogether remarkable for the long maintained excellence of its harvest weather which enabled all seed to be saved in splendid condition. Yields, however, were rather poor for which the earlier inclemency of the season, the depredations of vermin, and the unavoidable necessity for using an imperfectly tilled field were all contributory causes.

OATS:

The results of the 1930 oat variety trials were received with particular interest. These represented the second season's test of the new hybrid variety Stormont Arrow which had been so extraordinarily successful on its first appearance in trials in 1929. The impression that the seasonal conditions of 1929 must have been peculiarly suitable for this variety was to some extent confirmed, but again the variety gave a remarkably good account of itself.

There have now been made over the last two seasons thirty trials each of which included, as one of the six constituent varieties, Stormont Arrow. The results of this series of trials may be summarised as follows :—

Stormont Arrow has been 1st in 16 centres.
2nd in 6 centres.
3rd in 5 centres.
4th in 1 centre.
5th in 2 centres.

This placing is based on the cash value per acre of the crop, grain and straw, in each case.

As yet the number of trials is insufficient to make possible the identification of districts for which Stormont Arrow is likely to be particularly suitable, such as has been done in the case of the Swedish varieties. The present indications give the impression that the variety is more adaptable than the Swedish sorts, and approaches Potato very closely in this respect.

Individual comparisons between Stormont Arrow and the other varieties may be summarised as follows :—

Stormont Arrow equalled or improved upon—

Star in	11 of the	13 possible centres of comparison.
King	8	13
Crown	20	27
Victory	14	18
McGill Smith Potato	16	18
Stormont Potato ..	23	28

It should be remembered that the conditions governing these comparisons tend to operate against Stormont Arrow which is included in all trials, whereas the other varieties are now very largely confined to districts for which they are known to be particularly suitable and excluded from areas of known unsuitability.

The origin of Stormont Arrow has already been described in a previous report. The following notes will serve as a more detailed description of the variety than any which has been given hitherto.

Rate of Seeding ; Where Stormont Potato (a rather small-grained type) would be sown at 16 stones per statute acre, 17½ stones of Stormont Arrow will be required. The corresponding seedings for some other varieties are as follows : McGill Smith Potato 17½ stones, Victory 18½ stones, Crown 20 stones, King 20½ stones. These figures are based entirely upon the relative size of the grain in each case and do not take into account such differences in stooling capacity as may exist amongst the varieties.

Stooling : Stormont Arrow tillers as abundantly as Potato, about 5 per cent. more than Victory, 10 per cent. more than Crown, and 15–20 per cent. more than King.

Lodging : Resistance to lodging is a special merit of Stormont Arrow which is particularly suitable for land in good condition where there is normally the likelihood of a laid crop. The variety appears to be definitely more resistant than King, Crown, Victory or Potato.

Ripening : Stormont Arrow ripens about two days later than Potato sown in comparable conditions, and five or six days later than King, Crown, or Victory.

Straw : The straw equals in height that of Potato, Victory, and Crown, and is some three inches shorter than King. It is produced abundantly and though strong is not coarse. Straw of excellent quality can be procured if the crop is not allowed to over-ripen before cutting.

Grain : The grain is very short, broad and plump, of a good milling type. Grain yields are apt to be surprisingly in excess of estimates formed at harvest as the variety is a particularly "good thresher."

Of the other new varieties included in the past two seasons' county trials, Star, McGill Smith Potato, and Stormont Poland all seem to have found conditions to their liking in certain of the centres. Star appears to be particularly localised in its preferences and is, at its best, a very good variety.

In the spring of 1931 some 55 cwt. of pure seed of thirteen varieties of oats was supplied by the division for use in county trials. Fifteen trials involved varieties suitable for good cultural conditions, and fifteen other centres were supplied with varieties more likely to succeed in high-lying districts and generally poorer cultural conditions. No varieties completely new to the tests were introduced.

A further quantity of about 125 cwt. of pure seed of fourteen varieties was supplied to selected farmers who undertook to maintain purity and supply such of their neighbours as desired seed the following season. Similar small stocks of pure seed are distributed at a reasonable price each year, the system thus making the division a continuous source of pure stocks of seed.

To form a similar bulk of seed for trials and distribution in 1932, ten acres of last stage propagation plots were grown this season, principally at the North-West School, Strabane. In all, seventeen varieties in varying quantities were grown. New varieties available for county trials in 1932 include Eagle, the latest Swedish production, and a selection, unnamed as yet, made by this division, from the cross Potato-Sandy. This variety is likely to be a very useful newcomer to the series of trials placed in the poorer cultural conditions. Its performance in county trials will be watched with great interest.

Propagation plots at Stormont numbered fifteen large and thirty-five small, and included many new selections of hybrid origin. Small-scale tests at Stormont included 77 distinct varieties or strains, of which about 60 are new selections in process of comparison with the various standard varieties.

FLAX :

The usual small-scale variety test consisted of 72 plots and included 12 varieties. The only change in the composition of the test was effected by replacing Liral 1 by Liral 9. The results from county large-scale trials, now that these include the same series of varieties which has been under test at Stormont, agree very closely with the conclusions based on the Stormont trials, and form a useful index of the accuracy of these small-scale operations.

The early stages of propagation at Stormont in 1931 included 107 small and 26 larger plots. The later stages of propagation were again, for the fourth successive season, transferred to Essex. Weather conditions were very favourable and record yields of seed are anticipated.

The previous season's operations in Essex had been marred by abnormally bad weather conditions for the district, but even so an average rate of multiplication of about 10 times was attained. This was the lowest rate of increase yet recorded but did not interfere in any way with the progress of the scheme. One ton of each of the leading varieties, Stormont Gossamer and Stormont Cirrus, was sent to Canada as had been planned, there to initiate further propagation on a commercial scale, and so eventually to create in Canada a source of seed supply for Northern Ireland of varieties particularly suitable for our cultural conditions and trade requirements.

In 1931, in addition to seventeen small plots, the propagation scheme in Essex included eleven quarter-acre, two half-acre, and two five-acre plots. The largest plots are again of Stormont Gossamer and Stormont Cirrus and will probably yield this season more than twenty-five cwt. of cleaned seed each, which quantity will be available to refresh and maintain the purity of the existing stocks in Canada.

ANIMAL DISEASES DIVISION.

BOVINE STERILITY AND ABORTION:

Abortion disease continues to be a very serious problem to the dairy farmer and livestock breeder. Several new outbreaks involving large herds were reported during the year. On investigation these were found to be due to *Bacillus abortus* (Bang) There is little doubt that this organism is almost entirely responsible for outbreaks of abortion in Northern Ireland.

An effort has been made to control this disease on two farms using live " abortion vaccine," but no results are yet available for publication. The experiments have been hampered by the fact that on the farms in question cows have been disposed of for economic reasons (maintaining milk supply, etc.). An attempt at controlling abortion disease in a large herd by means of the blood test has been a complete failure. Reasons for this were :—(1) the herdsman did not immediately isolate reactors to the test, but continued to allow them to graze with the non-reactors. Some of these reactors aborted in the byre ; (2) efficient isolation after abortion was not practised in time.

Conditions generally on farms in Northern Ireland are not suited to the control of abortion disease by means of the blood test. If abortion disease is to be controlled by isolation and disinfection this must be done at the first indication of trouble. Unfortunately most farmers wait until the disease has made considerable headway in their herds before obtaining expert advice. Where a herd is heavily infected with abortion disease practical experience shows that it pays to keep a cow which has aborted, as usually she does not abort a second time and the newly-purchased cow which is required to take her place almost invariably aborts in her second year in the herd.

Farmers are now paying more attention to the treatment of sterile cows. Unfortunately there are many districts where it is impossible to obtain the services of a veterinary surgeon to treat this condition. The idea that barrenness or sterility is invariably due to abortion disease has not been substantiated by this division's experience of the blood test.

VIBRIO FETUS INFECTION:

107 blood samples were tested for evidence of Vibrio Fetus infection as a cause of abortion. Owing to the unsatisfactory nature of the results and to the fact that no standards were available for comparison, this investigation was suspended.

No aborted calves were received during the year, so that no opportunity of direct examination for Vibrio Fetus arose.

POULTRY DISEASES:

Thanks largely to the efforts and advice of the county poultry instructors, poultry farmers are making greatly increased use of the facilities for diagnosis, etc., provided by the division.

BACILLARY WHITE DIARRHOEA:

During the year under report 67,498 blood samples from some 500 farms were submitted to the blood test.

The value of the B. W. D. blood-testing scheme is now becoming widely known and the results in practice reported by the county poultry instructors are very encouraging. The immense strides that this work is making are due largely to the energy and enthusiasm of the instructors.

The value of systematic blood-testing cannot be sufficiently emphasised, as it is only by repeated testing that all the reactors in a flock are detected. It is worthy of note that a considerable number of farms which have rigidly adhered to the scheme drawn up by the Ministry have now passed completely two consecutive blood tests. Testing on these farms is now confined to one annual test. In practice such farms may be considered as B.W.D.-free farms. Poultry breeders, generally, are warned that eggs for hatching should not be used from any farm which has shown a number of reactors at the first test, until the second or, if necessary ,a third test has been carried out.

Again we have to record that a considerable number of outbreaks were traced to eggs or " day-old " chicks imported from Great Britain. Purchasers of eggs or stock should buy only from farms which can produce certificates of blood tests showing that they had passed two consecutive tests immediately prior to the breeding season. Unfortunately there is no legislation to prevent a farmer from calling his stock " blood-tested."

The necessity for removing reactors immediately and the return of their rings to the division is again emphasised.

SOURCE OF HATCHING EGGS:

The necessity for disclosing the source of eggs from which diseased chicks submitted for examination were hatched is not yet sufficiently realised. The campaign to free Northern Ireland from bacillary white diarrhoea cannot progress to the extent desired so long as this information is withheld.

WORMS:

Intestinal worms are going to prove one of the most serious problems in poultry management. The losses due to these parasites were exceptionally heavy during the past season. There is no satisfactory treatment. Worm parasites can be controlled by management. Chicks are hatched free from these parasites and obtain them only by picking over infected floors and ground. Brooder houses, etc., should be thoroughly cleaned and disinfected. The walls and floors should be flushed out with boiling water or flamed lightly with a painter's blow lamp. The chicks should be reared intensively until eight to ten weeks old and then put on virgin ground to which no fowl have had access for at least three years. Ground coming into use after crop rotation is safe.

No adult fowl of any kind should be allowed to run with young stock. Until these elementary points in connexion with poultry breeding are realised losses will continue. Over-stocking intensifies worm infection and a saturation point is reached at which the bird's natural defence to worm parasites is overcome ; heavy losses are then experienced. Where ground is unchanged year after year a time comes when it is almost impossible to rear poultry. Shrewd observers have long appreciated the advantage of fresh ground.

COCCIDIOSIS*:*

Many outbreaks of this disease were met with during the year. This is a disease which can be controlled and prevented by attention to strict hygienic principles. The measures detailed in the Ministry's leaflet No. 31 are very satisfactory and without the adoption of these measures there is no treatment at present known to give good results. It is pointed out that the originators of the Iodine treatment and the Hydrochloric Acid treatment insist on the observance of these strict, sanitary principles (rigorous cleaning at least every other day, etc.) and breeders who adopt either of the latter treatments without paying attention to the recommendations regarding general cleanliness have only themselves to blame when bad results are experienced. The measures detailed in this report for the prevention of worms also apply to Coccidiosis.

DIPHTHERITIC ROUP:

The use of vaccine against this disease has considerably increased. Satisfactory reports continue to be received. The cost of the vaccine is 1d. per fowl.

FOWL PARALYSIS:

Several outbreaks of this disease were experienced during the year. In all cases heavy infestation with worms and oocysts has to be recorded. Experiments are being conducted by the division to determine (1) if the condition is due to a filterable virus ; (2) if it is transmissible through the egg and (3) if it is transmissible by contact. The role played by worms and oocysts is also being investigated.

There is reason to believe that if breeders would only adopt the sanitary measures recommended for the prevention of Worms and Coccidiosis the incidence of Fowl Paralysis would greatly diminish.

TUBERCULOSIS:

158 milk samples were submitted under the Tuberculosis Order. 18 positive cases were found. 14 other samples, including faeces, glands, etc., were submitted for examination, with negative results.

SHEEP :

Lambing Sickness and Pregnancy Disease : Several outbreaks of these two conditions were reported. If sheep owners are agreeable it is hoped to collect material for investigation by the Ministry's Chemical Division.

General.

Miscellaneous specimens numbered 1,847. In addition 828 blood samples were submitted to the blood test in connexion with the diagnosis of Contagious Abortion.

FOOT-AND-MOUTH OUTBREAK :

During the month of June the activities of the division were greatly curtailed owing to the absence of the veterinary staff who were co-operating with the other veterinary officers of the Ministry in the necessary operations for the stamping out of this scourge. This interfered seriously with the research work of the division and upset any experiments that were being carried out.

EDUCATION :

The staff of the division has continued to be responsible for the teaching of Veterinary Science in connexion with The Queen's University of Belfast.

Twelve lectures to Milk Recording Associations and local branches of the Ulster Farmers' Union were given during the year.

PUBLICATIONS :

Avian Diphtheritic Enteritis and Swine Fever.—John P. Rice. The Veterinary Journal, January, 1931, Vol. 87, No. 1.

Laparotomy in a Pullet.—H. G. Lamont. The Veterinary Journal, Vol. 87, No. 1.

Poultry Diseases.—W. R. Kerr. "Eggs," August 12th, 1931. (Copy of Broadcast Talks.)

POULTRY DIVISION.

The ninth laying test conducted by the Ministry was held at Stormont for a period of 48 weeks and finished on the 15th September, 1931. The entries exceeded the available accommodation and a ballot was taken which resulted in the acceptance of 111 pens, of six pullets each, an increase of 8 pens over the previous year. The results of the test were, on the whole, satisfactory. There was a further slight increase in egg production and a general improvement in the size of egg. 184, or 27.6 per cent., of the pullets qualified for the award of sealed copper rings, having laid 200 or more first grade eggs and not more than 50 second grade eggs each. This was also an increase over the previous year. Of the 111 pens competing 12 (10.8 per cent.) were disqualified for producing more than 300 second grade eggs, whereas 17.4 per cent. were so disqualified in the previous test.

All birds were blood tested for Bacillary White Diarrhoea before being returned from the test and it was gratifying to find that only 19 of the total number failed to pass the test. The average egg production of these 19 birds was only 143.8 eggs as compared with 194.4 for the remaining 582 birds which completed the test period. A very disappointing feature of the test was the high mortality, especially amongst the White Wyandottes. The mortality was equivalent to 9.76 per cent. A pen of Rhode Island Reds the property of Miss Irwin, Tynan, County Armagh, won the Silver Cup presented by the Ministry in respect of the pen of pullets laying eggs of the highest market value during the test. This pen of pullets laid 1,523 eggs in 48 weeks, and thereby established a new record for the breed in an Irish test. This was the second year in succession that this trophy had been won by Miss Irwin. A Rhode Island Red pullet, the property of Mrs. G. Hegan, Annagh, Cookstown, laid 288 eggs, only two of which were second grade, during the 48 weeks of the test; this pullet was retained at Stormont to complete her year's laying and finished with a total of 307 eggs. This figure also established a new record for a Rhode Island Red pullet in an Irish test.

The Ministry's Winter Egg prize presented in respect of the pen of pullets laying first grade eggs of the highest market value during the first four periods (16 weeks) of the test was won by a pen of White Wyandottes, the property of Mrs. Johnston, Rathgael, Bangor, which also obtained first prize in Section I (White Wyandottes).

The Challenge Cup presented by the Council of the Scientific Poultry Breeders' Association for the pen of pullets laying eggs of the highest market value during the first four periods (16 weeks) of the test was won by a pen of Rhode Island Reds, the property of Mrs. Abernethy, Cherry Hill, Stewartstown.

The following table shows the number of pens from each county entered in the test for the past nine years :—

	1922–23 pens.	1923–24 pens.	1924–25 pens.	1925–26 pens.	1926–27 pens.	1927–28 pens.	1928–29 pens.	1929–30 pens.	1930–31 pens.
Antrim ..	3	16	17	11	13	22	20	22	24
Armagh ..	9	12	19	19	10	10	9	8	6
Down ..	23	34	24	29	24	32	42	33	35
Fermanagh ..	1	2	2	2	4	5	6	4	4
Londonderry ..	3	2	3	2	5	10	10	13	12
Tyrone ..	6	5	7	8	16	12	14	23	30
Totals ..	45	71	72	71	72	91	101	103	111

Of the 30 pens from County Tyrone in the 1930–31 test 14 were awarded prizes in the different sections.

Particulars of eggs laid, value of eggs, cost of food, and gross return over cost of food in respect of each of the nine tests carried out by the Ministry are given below :—

48 weeks ended	No. of pullets penned.	No. of eggs laid.	Average No. of eggs per bird.	Average value of eggs per bird.	Cost of food per bird.	Gross return per bird over cost of food.
				s. d.	s. d.	s. d.
16th Sept., 1923	270	51,025	188.98	32 6.9	9 10	22 9
15th „ 1924	426	77,383	181.6	33 0.5	9 10.25	23 2
16th „ 1925	432	78,565	181.6	31 10.7	10 1.6	21 9
16th „ 1926	426	80,798	189.66	30 6.64	10 1.8	20 5
16th „ 1927	432	81,732	189.19	26 9.2	10 2.2	16 7
15th „ 1928	546	100,378	183.84	26 4.28	10 2.1	16 2
16th „ 1929	606	109,970	181.47	27 9	11 0.25	16 9
16th „ 1930	618	112,418	182.0	27 7	9 0.59	18 6
15th „ 1931	666	121,426	182.32	22 10.88	7 1.2	15 9

Further particulars regarding this test will be found in the detailed report.

Preparations have been made for the tenth test which will commence on 14th October, 1931. The test plant has been extended by the addition of 48 new houses and runs and now comprises a total of 168 pens.

Demonstration experiments with poultry were again carried out. These comprised a comparison between oyster shell and limestone grit, and a comparison between birds provided with water in the house close to the mash hoppers and birds given water in the run only. The results in the case of the oyster shell against limestone grit were in favour of the oyster shell and were in agreement with the results of a similar experiment which was carried out the previous year. It will be necessary to have the second test repeated before any definite conclusions are arrived at, but the results suggested that it may be an advantage during the winter months to have the water supply in the house.

PUBLICATIONS :

Report on Egg-Laying Test, 1930–31.—M. J. Sheedy.

A Comparison of wet mash, dry mash and a combination of both in the feeding of Laying Pullets.—J. G. Rhynehart. " Eggs," Vol. XXV., Nos. 7 and 8, August 12th and 19th, 1931.

CROP AND ANIMAL HUSBANDRY DIVISION.

The work of this division falls into three main headings of Teaching, Advisory Work and Research and Experimental work and may be conveniently considered under these categories.

TEACHING.

The division continues to be responsible for all the teaching work in the subjects of Crop Husbandry, Animal Husbandry and Farm Management in the Agricultural Faculty of the Queen's University of Belfast. As in previous years considerable attention was again given to the holding of demonstrations on the farm of the Agricultural Research Institute, Hillsborough, and in the summer term weekly excursions were arranged throughout the province to good farms with some special feature of interest.

Several evening lectures were given to local branches of the Ulster Farmers' Union and Milk Recording Associations.

ADVISORY WORK.

The number of enquiries for advice and help was approximately the same as in the previous year and the field covered was again wide, including problems in connection with the management of grassland, management of livestock and farm organisation in general. There was an increase in the number of enquiries as to improvement and reconstruction of farm buildings, making of sheep dipping bath and pens, etc.

The Head of the division has represented the Ministry on the Advisory Committee of the Young Farmers' Club Movement in Ulster and visited during the year a number of the Clubs and assisted in the arrangement and holding of some of the live-stock judging competitions. An inter club judging competition was held at the Royal Ulster Agricultural Society's Show at Balmoral in May and it is interesting to record that the team selected to represent Ulster, for the first time, at the International contest held at the Royal Agricultural Society of England Show at Warwick in July, gained second place.

RESEARCH AND EXPERIMENTAL WORK.

Young Beef.—The study of systems of management and rearing in the production of young beef was continued during the year, by the courtesy of the Trustees of the Agricultural Research Institute. This year a bunch of young cattle were fattened and sold to the butcher in September at an average age of seventeen months without any indoor feeding period. These cattle ran out on grass during the whole of their life and the only housing they had was that for three months in the winter they were put in an open shed at nights. Their cost of production, as compared with some of their predecessors which had an eight-month indoor feeding period, was considerably lower. Four years' results, with various systems of rearing, feeding, etc., have now been accumulated and a report on this work, together with the financial cost of production, is in course of preparation.

Grassland Improvement.—The improvement of grassland is a subject of major importance to Ulster farmers and one in which more and more interest is being taken each year. Starting off with poor, rushy and tufty grassland the question of how to improve it falls broadly into three main lines of approach. The land may be ploughed up, put through a rotation of cropping and sown down again in the normal way, or, secondly, it may be ploughed with a shallow furrow and sown down straight away with or without a clover crop. The third method consists of effective cultivation, harrowing and so on but without ploughing, and the application of artificial manures. An experiment to afford an answer to some of the many points this problem presents was designed and commenced in 1929 at the Agricultural Research Institute, Hillsborough, by the courtesy of the Trustees.

The first method, sowing down after a rotation of crops, is the normal farm practice and opportunities are available for observing the results. The experiment was designed, therefore, to cover the second and third methods described above. Five plots, each two acres in extent, were fenced off individually. Plots 1, 2 and 3 received a thorough and effective harrowing and all the dead material was collected and carted off. Plot 1 received a complete manurial dressing of nitrogen, phos-

phates and potash ; Plot 2, phosphates and potash only, and Plot 3, phosphates only. Plots 4 and 5 were ploughed up in the spring of 1930 and Plot 4 drilled with oats. No cover crop was sown in Plot 5 and the following seeds mixture, consisting mainly of indigenous species, was sown in April on Plots 4 and 5 :—

	Rate per acre—lb.
Cocksfoot—wild	10
Perennial Ryegrass—wild	12½
Timothy—American	7
Red Clover—wild	1½
Late-Flowering Red Clover—Montgomery ..	1½
Rough Stalked Meadow Grass	1
Wild White Clover—English	1
	34½

When the oats were cut on Plot 4 the mowing machine was also run over Plot 5. Neither Plot 4 nor Plot 5 was grazed during the first year.

It is the intention, amongst other things, to measure the improvement in value of each plot by keeping the record of the stock carrying capacity. For this purpose each plot is treated as an individual unit and stock turned on to it as soon as it is ready for grazing. When the grass on the plot in question is eaten down the stock are removed, the plot rested, and grazed again when the grass is sufficiently grown. An accurate record is kept of the dates on which individual plots were grazed and also the number and class of stock.

Chemical analyses and botanical analyses are also being carried out.

This is a long term experiment which will last for a number of years and is being carried out jointly by the Department of Crop and Animal Husbandry, Agricultural Botany, and Agricultural Chemistry.

Potatoes.—Attention was drawn in last year's report to the fortunate position occupied by the North of Ireland for the production of "seed" potatoes and the possibilities of developing an export trade in this product.

An experiment was carried out in 1929 and repeated in 1930 to determine the effect of the size of seed tuber planted on the relative proportions of ware, seed and chats in the resultant crop. An account of this work has been published in the Ministry's Journal.

Three sizes of seed tuber were planted in the 1930 experiment. Normal size sets were obtained by riddling through a 2″ and over 1¾″ riddle, while a quantity of ware potatoes was dressed with 3″ and 2½″ riddles into larger and smaller sizes. The ground used was in good heart and reasonably uniform, so that reliable results were obtained. The crop from seed sets was 11.94 tons per acre with 36.8 per cent. of seed ; small ware sets gave 13.32 tons per acre with 43.5 per cent. of seed ; and the larger ware sets gave 14.28 tons per acre with 46.4 per cent of seed. The experiment this gave satisfactory confirmation under local conditions of results which have been obtained in various other places, namely, that larger sets give a heavier total crop, in which there is a higher proportion of the smaller sizes of tubers, than do smaller sets.

Reclamation of Bog.—In conjunction with the Chemical Division this division has continued to co-operate with an agricultural firm in County Armagh in the reclamation of used up bog. A further eight acres in addition to the area recorded last year were cleared, dug, manured and planted with potatoes, cabbages and mangolds. A portion of the crop was dug and weighed and returned a heavy yield of first-class potatoes which will be sold as "seed." An account of the operations necessary in this reclamation is being recorded, together with their cost and also the cost and quantities of manures applied and the yield and return obtained from the crop. The question of the use of machinery to reduce the somewhat large amount of hand labour is also being investigated.

Drainage.—The crying need of so much of the land in Northern Ireland for efficient draining is so obvious as to need no emphasis. The heavy cost which it entails, especially in a time of low prices, prevents however very much being done in this

direction. This division, nevertheless, has kept an eager eye on any advance which appeared to offer any possibilities of reducing the cost and the Head of the division was sent over by the Ministry to Scotland in the spring to see under working conditions a draining machine invented by a Scottish firm of engineers. This machine, which is capable of various operations, can when used as an excavator cut a trench in two cuts to a depth of 24″ to 30″ and at a speed not materially less than a good ploughing pace. The machine carried out the work so efficiently and so expeditiously that it offers a means of very materially reducing the very heavy cost of hand labour involved in field draining. Arrangements have been concluded with the firm in question to bring their machine over to Northern Ireland and give, in conjunction with the Ministry, a two-day public demonstration.

Crop Drying Machinery.—While the climate of the North of Ireland is in many respects ideal for the growth of many of the farm crops grown it cannot be said to be equally ideal for the harvesting of them. The saving of the hay crop or the harvesting of the oat crop is often a long, laborious and expensive operation. The Head of the division arranged for and attended a demonstration in England of a machine for the artificial drying of the hay crop and also of grain. This machine is a definite advance on any previous drying machinery and holds out distinct possibilities. It is hoped to be able to arrange for a demontration with this machine in Ulster next year.

Cost Accounts.—The division continues, with the help of the staff of the Agricultural Research Institute, to keep full and detailed cost accounts covering all the farming operations. Data from three full years has now been accumulated. As before, the accounts have been abstracted to obtain costs of various operations and works and have provided general figures for use in the management of the farm. They have also provided material for teaching work at the University and for the completion, by adding the financial aspect, of many of the experiments being carried out.

Meteorological Records.—By the courtesy of the Trustees of the Agricultural Research Institute a meteorological station was set up at Hillsborough in June, 1930, with the assistance of Captain W. Gillon, Meteorologist-in-Charge at Aldergrove and Inspector for the Meteorological Office. Standard instruments and equipment were obtained from the Meteorological Office of the Air Ministry, London, and the observations are made in the standard manner prescribed in the Observer's Handbook issued by that Office. The records kept are those likely to be of interest and value in connection with experimental work, cropping results, etc., but as they are made in the standard form they are accepted by the Meteorological Office for inclusion in its official reports. The following are the observations made at 9 a.m. Greenwich Mean time daily :—

Dry-Bulb Temperature.
Wet-Bulb Temperature.
Maximum Temperature.
Minimum Temperature.
Minimum Temperature on grass.
Earth Temperatures at depths of 4 inches, 8 inches and 1 foot.
Amount of rain.
Duration of bright sunshine.
Wind direction and force.
Visibility.
Cloud amount, form and direction.
State of ground.
Notes on weather since last observation.

GENERAL.

The policy of carrying out the reconstruction and renovation of the farm buildings at the Research Farm at Hillsborough by the farm staff was continued during the year. The division has been responsible for the planning and general management of this work and considerable progress has been made throughout the year. The major work during the past year was the conversion of an old disused saw bench shed into a row of six individual loose boxes for calving cows or sick animals. A careful record of the cost of these works is kept and is available. Very great interest in these works of reconstruction has been taken by visiting farmers, particularly because it has been done by direct labour and in such a manner that it can be copied by any enterprising farmer.

Visits.—A considerable amount of the time of the staff of the division is occupied in the summer months conducting parties of farmers, branches of the Ulster Farmers' Union, Milk Recording Associations, workers in Agricultural Science in Britain and abroad, etc., round the Research Farm at Hillsborough and demonstrating the experimental work being carried out. The number has increased very materially from the previous year and during the year under review some twelve to thirteen hundred visitors were shown over the Station. This is a very desirable feature of the division's work and while it absorbs a considerable amount of time it is undoubtedly one of the most valuable channels for the dissemination of the results of research and experimental work and, by effecting personal contact, allows of the discussion of the numerous points which crop up during the visit.

PUBLICATIONS :

The effect of the size of the set on the Resulting Potato Crop.—R. Rae and R. W. Hale. Journal of the Ministry of Agriculture N.I., Bo. III, 1931.

DAIRY BACTERIOLOGY DIVISION.

The work of the division was continued on the lines indicated in the previous reports. As heretofore the greater part of the time was taken up in routine and advisory work arising out of the Sale of Milk Act (Northern Ireland), 1927.

As previously pointed out, this Act makes provision for the licensing of one grade of milk, that is Grade A (Tuberculin Tested). Under this Act licences are issued by the Ministry of Home Affairs to milk producers who have their herds tuberculin tested twice yearly and who conform to the requirements as regards byres, dairy, equipment and the production of milk of a specified standard of cleanliness. The officers of this division are responsible for the advisory work in connection with the Act and also make recommendations to the Ministry of Home Affairs as to the suitability of applicants for licences.

The twelve month period to which this report refers has seen a great advance in connection with Grade A (T.T.) milk production. The number of licensed producers has increased by 12 and now stands at 36, while the number of licensed retailers increased by 13 and now stands at 16. It is satisfactory to report that a great number of new licensees represent very large herd owners, with the result that the number of cows now officially under test has been doubled during the year, the number now being approximately 1,500.

In connection with the control of Grade A (T.T.) milk 1,225 samples were examined bacteriologically, 383 of these being taken as surprise samples when officers of the division visited licensed farms. In conjunction with these surprise visits the work of checking Tuberculin Test Certificates was carried out and at the same time advice was given on matters which arise from time to time in the routine of clean milk production. It is evident from the results obtained that the licensed producers have been doing their work in a highly satisfactory manner and it is doubtful if from the point of view of cleanliness and purity their milk supply can be equalled anywhere. Several problems were investigated for licensed producers on the farm and in the laboratory and advice given as to the causes of the troubles and means of remedying them. Work of this nature increased enormously during the year : this was partly due to the damp cold season which brought in its train an abnormal amount of udder troubles.

The number of visits paid to prospective producers showed a big increase over the previous year and there is hardly a small town in Northern Ireland which will not have a supplier in the near future. During these visits advice was given with reference to improvements required in byres, dairies and water supplies before a licence could be granted.

Special efforts have been made to bring the merits of Grade A (Tuberculin Tested) milk before the authorities responsible for the control of public institutions, hospitals and educational establishments. This campaign has the backing of the medical profession generally and the results of the efforts have been highly satisfactory, most of the leading institutions now using nothing but Grade A (T.T.) milk. This is especially true with regard to Belfast as practically all the leading institutions now specify Grade A (T.T.) milk in their contracts.

CLEAN MILK COMPETITION.

Such keen interest was displayed by producers in the 1930 Clean Milk Competition

that it was decided to run another in 1931. As heretofore it was confined to licensed producers and attracted an entry of 18 competitors. The competition extended over the spring and summer months from the 1st April to 30th September. Some changes were made in the allocation of marks and a new feature was the introduction of the Keeping Quality Test. The number of " Inspections on the Farm " was reduced to three, two being evening and one morning. Marks were allotted according to the following scale :—

A. *Judging on the Farm*		200
Equipment	50	
Methods	150	
B. *Examination of Milk*		450
Bacteriological Count	160	
Absence of Coliform Organisms	120	
Butter-fat	10	
Solids-not-fat	10	
Keeping Quality	150	
Total		650

The total number of samples taken was 207, of which 86 were from the morning's milking. One of the competitors retired after three samples were taken. The competition was entirely satisfactory, 14 of the 17 competitors obtaining over 75 per cent. of the available points and therefore qualifying for the Ministry's Certificate of Merit. Outbreaks of mastitis during the early part of the competition were responsible for 2 of the competitors securing low marks.

CREAMERIES.

Work in connection with the bacteriological control of creameries was continued during the year. In all 121 samples were examined : these consisted of milk, cream, butter, water and " starters." Special efforts were made to help creameries engaged in the cream export trade. Many creameries have difficulty in producing a cream that will stand up to the trying conditions to which it is subject during transport. During the year experiments were carried out in a few creameries to ascertain the most suitable method of pasteurizing cream for this trade. Samples were taken during various stages in the creameries and the results of the examinations have proved very valuable to the managers concerned. As a result of this work it is hoped that definite suggestions can later be made as to the most satisfactory technique to adopt in the creamery. Arising out of this work recommendations will be made as to the bacteriological standards which should be laid down governing cream for export.

Advisory visits were paid to a number of creameries engaged in the manufacture of butter and routine samples were taken of the milk supply and the cream during various stages of the manufacturing process. As a result of this work advice was given as to the quality of the mixed milk supply. The efficiency of the pasteurizing and cooling processes used was demonstrated and the sources of contamination (if any) were located. Most of the water supplies examined were very poor and contained organisms which were very detrimental to butter and cream. In many cases it was demonstrated that the results of good pasteurization were negatived by re-contamination from dirty cream pumps, ripening vats and churns.

FOOT-AND-MOUTH DISEASE.

The veterinary members of the staff assisted the Diseases of Animals Branch in the measures which were taken to stamp out the outbreak of this disease which occurred during the month of June at Downpatrick.

MISCELLANEOUS.

Under this heading 163 samples were examined, consisting chiefly of ungraded milk and samples submitted by farmers. Most of the samples were taken in connection with an investigation which is being carried out by the division on the quality of ordinary milk as sold in Northern Ireland. The remainder were submitted by farmers and veterinary surgeons : these included milk taint troubles, suspected tubercular milk, and cream and butter taints.

During the year four lectures were given to students of the Faculty of Agriculture, Queen's University, on General Dairy Bacteriology and the Production of Grade A (T.T.) Milk.

SPECIAL POTATO AND FLAX EXPERIMENTS.

PROPAGATION OF SELECTED STOCKS OF POTATOES.

The propagation of improved stocks of potatoes which was started in 1926 continues to receive the attention of the Ministry. The aim of this branch of work is to propagate and establish, on a commercial scale, stocks of the more popular varieties of potatoes free from the virus diseases of Mosaic and Leaf-Roll. The method followed is to select single potato plants which are considered to be quite healthy, and from each of these plants to make separate propagations in a turnip crop. In the early stages of propagation all units which show symptoms of unhealthiness are discarded and, as the selection is carried out in a very rigorous manner, there is only a very small proportion of the original units retained for bulk propagation.

In order to provide evidence with regard to the value of this work, experiments were carried out in 1930 in which selected stocks of four varieties of potatoes were compared with farmers' ordinary stocks of these varieties at different centres in the scheduled districts in the counties of Down and Londonderry. The average results obtained per statute acre were as follows :—

Variety tested.	No. of tests.	Excess yield of Selected over Farmers' Stocks.
Arran Victory	14	3 tons 16 cwt.
Arran Consul	14	3 „ 2 „
Great Scot	12	2 „ 3 „
Arran Banner	13	1 „ 12 „

In 1931 experiments on similar lines were again carried out with Arran Victory and Champion potatoes and the average results per statute acre were as follows :—

Variety.	No. of tests.	Excess yield of Selected over Farmers' Stocks.
Arran Victory	12	3 tons 13 cwt.
Champion	3	3 „ 0 „

Small sample lots of Selected Stock Champion seed potatoes were sent to Malta for test purposes, and, as a result, a most favourable report was issued by the Maltese Department of Agriculture.

The propagation of Selected Stocks of Arran Victory and Champion potatoes on a commercial scale is now being carried out by a considerable number of farmers, and stocks of selected Arran Victory are also being propagated for seed distribution at the Ministry's School farms. These Selected Stocks are now in very active demand and are rapidly replacing the ordinary stocks throughout the country.

For the purpose of improving the stocks of Arran Victory potatoes grown in the scheduled district in County Down, the Ministry provided in that area in 1931 20 tons of Arran Victory seed potatoes from a selected stock grown on the farm of the Ulster Dairy School, Cookstown. These potatoes were disposed of to selected farmers under agreements which required (1) special precautions to be taken to maintain the vigour and health of the stock and (2) that the produce would be sold to local farmers at a reasonable price. The crops from these selected stocks have proved very much superior to those grown from the ordinary stocks and there is no doubt but their that introduction will, in due course, effect a general and very much needed improvement in the stocks of Arran Victory grown in the scheduled district in county Down.

In addition to the Arran Victory and Champion varieties of potatoes the Ministry is now propagating selected stocks of other of the more popular varieties, including Arran Consul, Arran Banner, Di Vernon, Great Scot, Kerr's Pink, Majestic, British

Queen and Up-to-Date. The quantities of seed potatoes produced from these stocks are still small, and it will be a few years before they can be available for distribution on a commercial scale.

POTATO VARIETY TRIALS.

The testing of new immune varieties of potatoes against standard varieties was again repeated at the trial grounds at Stormont. The number of new varieties included in these tests was about eighty-five, and a few of these, although in the early stage of development, show promise of being capable of replacing the standard non-immunes.

INTER-DEPARTMENTAL POTATO IMMUNITY TRIALS.

In these trials which are carried out at Kilkeel, County Down, in co-operation with the English Ministry of Agriculture and Fisheries and the Scottish Department of Agriculture, new seedling varieties of potatoes are tested for immunity from Black Scab. Each variety has to undergo a minimum of two years' tests. In the first year the test is limited to one centre, but in the second year the test is carried out at each of the three centres in England, Scotland and Northern Ireland.

As a result of these tests the introduction of new varieties of potatoes is now confined to immune varieties, the raisers voluntarily agreeing to discard all varieties that prove susceptible to Black Scab.

In the trial grounds at Kilkeel in 1931 the first year's tests included about 100 seedlings, the majority of these being tested, unofficially, for the guidance of the raisers.

The number comprised in the second year's test was 45 seedlings, all of which were also tested in England and Scotland.

FLAX EXPERIMENTS.

Considerable progress has been made in recent years in the breeding of new varieties of flax and there are a number of these varieties that are not only superior to the flax grown from Dutch and Pernau seed but also to the well-known pure strain, "J.W.S." flax for fibre production.

For the purpose of determining the relative merits of these varieties field trials were carried out in six centres in the counties of Antrim, Armagh, Derry and Tyrone during the years 1930 and 1931. The varieties included in these tests were as follows :—

Stormont Gossamer, Raiser—Ministry of Agriculture, N.I.
„ Cirrus, „ —„ „ „ „
Hunter's Hybrid. „ —D.A.T.I.
Pioneer, formerly Liral No. 1. Raiser-Linen Industry Research Association.
Beatall, „ „ No. 2. „ „ „ „
Monarch, „ „ No. 3. „ „ „ „
Crown, „ „ No. 4. „ „ „ „
Purple, „ „ No. 6. „ „ „ „
Dominion, „ „ No. 9. „ „ „ „
Blenda, Raiser Svalof Plant Breeding Station, Sweden.
Dutch ((Commercial).
Pernau Crown (Commercial).

In the 1930 trials Stormont Gossamer, Stormont Cirrus and Crown (Liral 4) proved superior to " J.W.S.," whilst much the poorest results of all were obtained from the Dutch Commercial seed. The results from the 1931 trials are not yet available. It is proposed, before publishing results in leaflet form, to continue these trials on similar lines for a few consecutive seasons and thus obtain average results which will be representative of the different conditions in different seasons.

In addition to the experiments in this country, the same varieties are being concurrently tested in Canada by the Fibre Division of the Canadian Department of Agriculture so that the results obtained in Canada can be co-related with those obtained in Northern Ireland.

BULK PROPAGATION OF PURE STRAINS OF FLAX SEED.

The production of pure strains of flax seed continues to be carried out both in Canada and in England. Owing, however, to the severe fall in the prices of both flax fibre and of flax seed the area in each of these countries has been very much reduced during the past season.

Experiments in the propagation of pure strains of flax seed in New Zealand have been carried out at the Canterbury Agricultural College, and at other adjacent centres. Excellent yields of seed of prime quality were obtained, and the experiments clearly indicate the suitability of that country for the production of flax seed suitable for sowing for fibre production. It is doubtful, however, if the seed could be produced on a profitable basis for shipment to this country at the low prices which were current in the past season.

SPECIAL HORTICULTURAL EXPERIMENTS.

Black Currant Mite.—Investigations regarding the control of this pest have now been in progress since 1927–28. The only new feature of note in the conduct of the past year's trials was that the sprays were applied at a later date than formerly. While the results obtained were fairly satisfactory in that the spread of the pest had been checked to some extent, the results are not regarded as being sufficiently convincing to warrant a general recommendation being made until further details are available.

Capsid Bug Experiments.—Apple Trees.—The experiment on trees of the variety "Grenadier" was continued on much the same lines as in the previous year except that all the trees, apart from those in the control plots, were sprayed three times with Bordeaux Mixture (2.6.40) plus Nicotine or with Bordeaux Mixture (2.6.40) to which Nicotine Sulphate had been added. The spray was applied in a fine mist by means of an engine-driven pump, working at a pressure of 200 lb. per square inch. The trees were sprayed about three weeks before the flowers were expected to open, again just as the first blossoms opened and finally about twelve days after the blossom had fallen. Owing to the very wet weather during May and June it was almost impossible to get the foliage dry enough to permit of the sprays being applied. The best days during the period that the spray could have been applied successfully were occupied with other work and the spraying had to be done under rather unfavourable weather conditions, such as light rain and dull skies accompanied by high to moderate winds. The machine used was fitted with two Meyer's Guns, each capable of delivering about 3 gallons of spray per minute. The crop of fruit was light but showed greater freedom from blemish caused by apple capsid and apple scab than in previous years. The control trees carried no crop of fruit but the average crop from the sprayed trees was well above that of the district for this variety.

There was again slightly less damage from capsid bug attack in the fruit on the trees sprayed with Bordeaux Mixture and Nicotine than in that from the trees which were sprayed with Bordeaux Mixture and Nicotine Sulphate. However, as the cost of the Nicotine Sulphate is only about half that of the Nicotine it is doubtful if the Nicotine is the more economical to use.

As the high boiling neutral tar oils gave such poor results in the previous year's experiments it was decided to discontinue the experiment in the Bramley orchard and to confine the work to an orchard of Lane's Prince Albert. In this orchard nineteen plots were sprayed, eleven with high boiling neutral tar oils and the remaining eight with mixtures of high boiling neutral tar oils and mineral oils or with mineral oils only. With the exception of two plots which were sprayed with mineral oils early in April all the plots were sprayed during the first week of March. Several of the high boiling neutral tar oils caused some damage to the apple tree buds, and where a mixture of mineral oil and high boiling neutral tar oil was applied damage also resulted.

The fact that the mineral oils did not cause any damage even when applied in April is worthy of note. The fruit from each plot was weighed and graded during the autumn when it was found that the fruit from the trees to which the mineral oils had been applied during the first week in April was practically free of capsid damage, whereas a large proportion of the crop on the trees which had been sprayed in March was, in the majority of the plots, seriously damaged by the punctures of the capsid bug. It was also observed that the mineral oils did not control apple aphis or apple

sucker, though these pests were controlled where the trees had been sprayed with tar oils. It is proposed to continue this experiment during the coming year to test more fully the effect of a late application of the mineral oil on the control of this pest.

Capsid Bug and Apple Scab Experiments.—These experiments were continued on the same lines as in previous years but another orchard was selected for the trials. It was again demonstrated that a pump working at a pressure of 200 lb. per square inch gives a much better control of apple scab and apple capsid than a pump working at a pressure of 80 to 100 lb. per square inch.

Apple Thinning Experiments.—The experiment started in 1930 (see last year's report) was continued in 1931. On the whole the crop in the orchard was light and little difference could be seen in the season between the crop on the trees on which the " set " of fruit was thinned in 1930 and that where the " set " was unthinned. During the last week of June the trees on which the fruit was thinned in 1930 were gone over and the apples singled to one fruitlet in each cluster, leaving, where necessary, single fruitlets six to nine inches apart. Later in the season the difference between the thinned and unthinned crops was very marked, the former being the heavier and consisting of larger fruit. When the crops were graded and weighed later it was found that the trees on which the " set .. of fruit had been thinned in 1930 and 1931 carried over three times the crop produced by the trees on which the fruit was left unthinned during the same period. Further, the increase in crop was mainly due to the production of larger sized apples. From the results of tests already carried out it is evident that it pays to thin apple fruitlets during years of heavy " sets " of fruit and it is likely that this operation would prove to be profitable in most seasons. It is hoped to repeat this experiment in 1932.

ULSTER DAIRY SCHOOL FARM.

The lines on which this farm was run during the year did not differ very materially from those of previous years. The most important section on the farm is the dairy herd of about 40 Dairy Shorthorn cows (pure-bred and non-pedigree) which is maintained with the object of providing a means of practical instruction for the students. The cows are almost entirely home-bred, the practice being to mate the females with Double Dairy Shorthorn bulls and retain the heifer calves for breeding. The milk of each cow is weighed daily and tested periodically for butter-fat. Only those cows which give satisfactory yields and are otherwise suitable are retained in the herd. During the year eleven cows were replaced by this number of first calf heifers. The greater number of the bull calves is purchased by farmers, usually with the object of using them for breeding purposes, while the remainder are castrated and reared as stores. The new milk is separated in the School dairy, the separated milk being returned to the farm for calves, pigs and poultry.

A herd of about twelve breeding sows is maintained. These are mostly pure-bred Yorks but there are some pure-bred Ulsters and some cross-breds. The boars used are either pure-bred York or pure-bred Ulster. This herd is a source of supply of premium boars to a number of farmers throughout Northern Ireland, while a large number of young sows are also purchased by breeders. All the pigs which are not sold or retained for breeding are fattened for slaughter. A flock of about 35 black-face ewes is kept. These are mated with a Border Leicester ram to get butchers' lambs. Usually about 20 wether lambs are purchased each autumn and fattened during the winter.

The usual crops are grown, the following seven course rotation being adopted :— Oats ; Roots or Cabbages ; Oats ; Potatoes ; Barley or Wheat ; Hay ; Hay. This rotation, although not usual in Northern Ireland, is found to work very satisfactorily and gives a balance of crops which suits the requirements of the stock kept. The crops, with the exception of potatoes, are consumed on the farm. The area under potatoes is taken up largely with either new varieties or specially selected healthy stocks of existing varieties and the produce is sold to growers. The barley is found to be very good for pig feeding, while the wheat is made into meal for the School or used for poultry feeding. Field experiments on different varieties of crops and live stock experiments with different breeds of pigs and on the feeding of calves were carried out during the year. Records were kept of the cost of rearing young pigs until the

weaning stage and also of the cost of feeding from weaning until slaughtering. These records are very interesting and indicate that the rearer gets a better return on his expenditure than the farmer who buys the suckers and fattens them. In other words, to get the best return from producing pork, rearing should be combined with fattening. Animals from the experimental lots of calves and pigs and a sow and her litter which had been costed were shown in the Ministry's Educational Exhibit at the Royal Ulster Agricultural Society's Show in May.

Demonstration experiments on the value of early hatching were carried out in the poultry section and provided a valuable object lesson to the pupils. In this section various types of houses for poultry, including the slatted floor type, are being tested.

During the year the farm was visited by several organised parties, mostly members of the Ulster Farmers' Union or Milk Recording Associations.

NORTH-WEST SCHOOL FARM.

The farm of about 52 acres is utilised largely as a centre for experimental work. Propagation plots of new varieties and strains of oats raised at the Ministry's Plant Breeding Station are grown and the produce threshed and returned to the Station for distribution to farmers. Ample provision for keeping the varieties separate during threshing and cleaning has been made. Plots comparing different varieties of potatoes, mangels and turnips were also laid down and useful information regarding the cropping capabilities of the varieties under test obtained. The tests comparing cut seed potatoes with whole seed were continued and the results were somewhat similar to those already reported, suggesting that where cutting is not done until planting time there is less risk of blanks occurring in the crop than where the potatoes have been cut for some time before planting. The results further suggest that there is no apparent benefit to be derived from the practice of liming the cut surfaces of the sets. It was found also that the use of large tubers planted whole encouraged the production of an increased proportion of seed-sized tubers in the resulting crop.

Observation plots of lucerne and subterranean clover were laid down to obtain information on the suitability of these crops for Northern Ireland. It is too early to give an opinion but it was found very difficult to keep weeds in check on the lucerne plots. Pastures formed from different types of seeds mixtures were in grazing during the season and the sole produced by each mixture was noted. The necessity of including permanent species, such as cocksfoot and wild white clover, was apparent.

In the live stock department further experiments were carried through. In view of the low price prevailing for potatoes last season it was of importance to ascertain how surplus supplies might be utilised to the best advantage on the farm. Pig feeding offered an obvious outlet and the maximum extent to which potatoes might be included in the rations for fattening pigs without reducing the efficiency of the ration was a point of much practical importance. An experiment which included twenty pigs was arranged and carried out on the farm. The feeding given to each lot and the results obtained are shown in the following table :—

Rations given.	Average daily live weight gain per pig.	Meal equivalent* to produce 1 lb. live weight increase.
All meal—no potatoes	1.42 lb.	4.06 lb.
1 part meal to 1 part potatoes ..	1.49 „	3.86 „
1 „ „ „ 2 parts „ ...	1.52 „	3.66 „
1 „ „ „ 4 „ „ ..	1.52 „	3.94 „

* 4 lb. boiled potatoes is equivalent to 1 lb. meals.

These results indicate that the most efficient ration was that in which 2 parts boiled potatoes were added to 1 part meal mixture.

The pigs were exhibited in the Ministry's Educational display at the Annual Show of the Royal Ulster Agricultural Society and the animals together with the particulars relating to feeding, etc., which were displayed were of much interest to visitors. Further live stock demonstration work done during the year included a costing record of pork production with different rations and of early maturity beef production.

The fruit and vegetable gardens were again utilised as centres for various experiments in connection with the manuring and management of fruit trees and bushes, the control of pests and diseases, and the testing of varieties of vegetables and methods of cultivation. Since the apple orchard is used as a poultry run the advantages of this system to both fruit and birds are demonstrated in routine practice.

As in past years parties of visitors organised by Milk Recording Associations, etc., visited the School during the summer months and had an opportunity of seeing over the farm and premises.

APPENDIX III.

AGRICULTURAL LAWS.

	Page.
Diseases of Animals Acts	60
Live Stock Breeding Act (Northern Ireland), 1922	64
Horse Breeding Act (Northern Ireland), 1926	65
Markets and Fairs (Weighing of Cattle) Acts, 1887 and 1891	66
Destructive Insects and Pests Acts, 1877 and 1907	66
Fertilizers and Feeding Stuffs Act, 1926	67
Bee Pest Prevention Act (Ireland), 1908	67
Weeds and Agricultural Seeds Acts (Northern Ireland), 1909 and 1929 ..	67
Sale of Food and Drugs Acts, 1875–1907	67
Marketing of Eggs Acts (Northern Ireland), 1924–1931	68
Marketing of Potatoes Act (Northern Ireland), 1928	71
Marketing of Dairy Produce Act (Northern Ireland), 1929	72
Agricultural Produce (Meat Regulation) Act (Northern Ireland), 1930 ..	73
Marketing of Fruit Act (Northern Ireland), 1931	73
Merchandise Marks Acts, 1887–1926	74

APPENDIX II.

DISEASES OF ANIMALS ACTS.

NEW ORDERS.

The Portal Inspection (Northern Ireland) Order of 1931, *dated 1st January,* 1931.

It was found towards the end of the year 1930 that there was no prospect of anything like regular shipments of live stock from the port of Newry in the immediate future and, accordingly, it was decided, in order to save the expense of maintaining an inspection staff at the port, that as from the 1st January, 1931, Newry should be removed from the list of ports from which live stock can be shipped to Great Britain. The Ministry will, of course, be prepared at any time to consider the question of restoring the necessary inspection facilities in the event of arrangements being made for regular shipments from this port.

The Animals' (Disinfection) (Northern Ireland) Order, 1927, *Amendment Order,* 1931, *dated 21st February,* 1931.

Prior to the making of this Order the Ministry had the following standards for disinfection, where such disinfection was required, to comply with the Orders made under the Diseases of Animals Acts :—

(*a*) a 5 per cent. solution of standard Phenol ;
(*b*) a 1 per cent. (minimum) solution of Chloride of Lime (containing not less than 30 per cent. of available Chlorine) ;
(*c*) a 4 per cent. (minimum) solution of carbolic acid (containing not less than 95 per cent. of actual carbolic acid), or
(*d*) a disinfectant equal in disinfectant efficiency to the above-mentioned solution of carbolic acid.

The Ministry decided, however, to require that all disinfectants to be used for the before-mentioned purposes should be related to the standard Phenol basis and be equal in disinfective efficiency to that solution, and should require the Ministry's specific approval. The above Order gives effect to these new requirements and also makes it compulsory to have approved disinfectants labelled in prescribed terms, giving lucid details regarding dilution, etc. In addition the Order provides for the sampling of approved disinfective at the time of their use.

The Swine Fever (Belfast) Order, 1931, *dated 21st April,* 1931.

As happened in a previous similar case the Ministry was able early in 1931 to trace a particularly virulent epidemic of swine fever throughout Northern Ireland to store swine purchased in Belfast saleyards and, accordingly, the Ministry was obliged to prohibit the sale or exposure for sale of store swine at any public sales in Belfast.

Peat Moss Litter (Prohibition) Order of 1931, *dated 13th May,* 1931.

There is in Northern Ireland a demand for peat moss from Scotland and the Ministry did not feel justified in maintaining the embargo placed on its importation. The above-mentioned Order removes, in so far as peat moss from Scotland is concerned, the embargo on the importation into Northern Ireland of peat moss won or cut anywhere in Europe outside the Irish Free State.

The Foreign Animals (Northern Ireland) Order of 1931, *dated 9th June,* 1931.
The Foreign Hay and Straw (Ireland) Order of 1912, *Amendment (Northern Ireland) Order,* 1931, *dated 9th June,* 1931.

Owing to the appearance of Foot-and-Mouth Disease in Southern Rhodesia bordering the Union of South Africa, it was found necessary to exclude the Union from the schedule to the above-mentioned Orders, thereby prohibiting the bringing into Northern Ireland of animals, hay or straw from South Africa.

FOREIGN ANIMALS.

There were no foreign animals landed in Northern Ireland and found diseased during the period covered by this Report.

OUTBREAKS OF DISEASE.

During the past twelve months the following outbreaks were reported to the Ministry :—

Bovine Tuberculosis.		Anthrax.	Parasitic Mange.	Sheep Scab.	Swine Fever.	Foot-and-Mouth Disease.	
No. of Outbreaks.	No. of animals affected.	Outbreaks.	Outbreaks.	Outbreaks.	Outbreaks.	No. of Outbreaks.	No. of animals affected.
1,170	1,206	None	2	83	47	13	93

Foot-and-Mouth Disease.

Unfortunately, the existence of Foot-and-Mouth Disease in County Down was confirmed by the Ministry's Chief Veterinary Officer on the 17th June, 1931, on a holding in the townland of Ballydugan, near the town of Downpatrick. The disease had not appeared in Northern Ireland during the previous 19 years. In accordance with arranged procedure between the Ministries in Great Britain and the Irish Free State and this Ministry, the shipment of cattle, sheep, goats, other ruminants and swine from all Northern Ireland ports was immediately suspended.

A scheduled area having a radius of 15 miles from the town of Downpatrick was immediately declared. The movement of ruminants or swine into, out of, or within this scheduled area was strictly forbidden and, inside the area, in addition, hay or straw could not be moved on any thoroughfare, and the keeping of all dogs therein under strict control was ordered. Further, the holding of markets, fairs and shows of live stock in County Down was prohibited.

In addition, the Ministry placed an absolute embargo on the movement of all cattle, sheep, goats, other ruminants or swine out of the administrative County of Down and out of the County Borough of Belfast.

The Ministry's Veterinary Inspectors operating from Downpatrick combed all farms in the scheduled area and, where necessary, carried out slaughtering operations. In all, twelve additional outbreaks directly traceable to the initial outbreak were located, but in two cases the outbreaks were situated on separate farms in the same ownership.

It was found necessary to slaughter animals as shown in the following table :—

	Cattle.	Sheep.	Goats.	Swine.
On Infected Farms.				
(a) Affected animals	92	1	–	–
(b) Animals not affected ..	245	373	9	13
**On Farms in dangerous proximity to infected farms .. .. ..

on several occasions and all animals having been found healthy the Ministry permitted normal stocking to take place.

As already indicated, shipments of live stock to Great Britain were suspended as from the 17th June. On the 4th July the British Ministry relaxed their total embargo on Northern Ireland live stock exports so far as to allow fat animals with the exception, of course, of animals from County Down or Belfast, to be shipped from Northern Ireland ports with the exception of Belfast, for immediate slaughter within the landing places at the ports of Birkenhead, Cardiff, Glasgow and Holyhead.

On the 15th July a further relaxation was made whereby animals could be landed at all landing places in Great Britain from all Northern Ireland ports, except Belfast, for slaughter within the landing place or for movement under licence to slaughter houses for slaughter within 10 days. This relaxation was further extended on the 21st July to embrace the movement of store animals to premises for isolation for 10 days. The embargo on animals originating in County Down or Belfast, however, still continued in force.

The prohibition on the shipment of animals from Belfast and County Down, was removed as from the 27th July, except from the area scheduled; fat animals to be slaughtered within 10 days and store animals to be moved to premises for 10 days' detention.

As from the 22nd August the British Ministry permitted the normal importation of animals, both fat and store, from all Northern Ireland ports under the usual conditions, *i.e.*, ten hours' detention in the landing place and six days at the place of destination.

Throughout the operations the Ministry's Chief Veterinary Officer had constantly in mind the importance of endeavouring to determine the manner in which the disease was conveyed to Northern Ireland and the problem was simplified by the fact that it resolved itself into a question of ascertaining the origin of the outbreak on the farm where the initial outbreak of disease was confirmed on the 17th June. As already indicated all the other outbreaks were directly traceable to the outbreak on that farm. A careful examination of all the relevant circumstances showed that prior to the 27th May disease in an infective stage did not exist on the farm but that during the last two or three days of May and the first two or three days of June infection existed. Allowing, therefore, for the usual period of incubation it seems certain that the virus of the disease was introduced to animals on the farm during the few days prior to the 27th May, and although by that date and for some time afterwards there was no clinical sign of disease the animals were capable of transmitting infection.

The most exhaustive enquiries failed to bring to light any source whatever from which during the period indicated the virus could have been introduced, with, however, one important exception. On the 22nd May Dutch cauliflowers were brought to the farm and the outside leaves were thrown on a refuse heap accessible to animals. It is an accepted fact that green stuff of this nature can convey the virus of Foot-and-Mouth Disease, and it is of the greatest significance that during the month of May, 1931, over 700 outbreaks of Foot-and-Mouth Disease were confirmed in Holland where the farming system employed frequently brings animals into close contact with vegetable products.

Two main facts, therefore, emerge in connection with the unfortunate outbreak :—

(1) Every case of disease could be traced to one farm in Northern Ireland;

(2) The only apparent source of infection on that farm was Continental vegetables.

IMPORTATION OF BREEDING ANIMALS.

(*a*) *Farm to Farm.*

The following breeding animals were imported into Northern Ireland from approved premises in Scotland to approved isolation premises on the importers' farms, under permit issued by the Ministry, after careful enquiries had been made in each

individual case :—40 cattle, 618 sheep and 1 Large White York Sow. The cattle importations were made up of the following breeds :—

Shorthorns	..	6 bulls, 3 cows and 3 heifers.
Ayrshires	..	1 bull, 1 cow and 24 heifers.
Aberdeen Angus		1 bull.
Galloway	..	1 bull.

The sheep importations were :—
1 Border Leicester ram.
9 Border Leicester ewes.
608 Blackface ewes.

Importations from approved sales in Scotland to farms in Northern Ireland totalled 40 cattle, comprising 7 Shorthorn bulls, 12 Aberdeen Angus bulls, 18 Galloway bulls, together with 1 Shorthorn bull and 2 Shorthorn heifers for residents in the Irish Free State.

(*b*) *Quarantine Station.*
The following pedigree breeding animals were imported into Northern Ireland from England via the Belfast Animals Quarantine Station, in five consignments :—

4 Shorthorn bulls.
15 „ cows.
26 „ heifers.
1 Red Poll bull.
1 Kerry ram.
14 „ ewes.
1 Algerian ram.
1 Suffolk ram.
2 „ ewes.
1 Large White boar.
2 „ sows.

IMPORTATION OF GOODS PACKED IN HAY OR STRAW.
Goods packed in hay or straw from Great Britain were imported into Northern Ireland under authority of licences issued by the Ministry in 325 cases. The principal commodities imported in this way still comprise fire-clay goods and glass bottles. Goods similarly packed were imported from places abroad under authority of 54 licences issued during the period under review. These licences mainly covered straw envelopes which had been subjected to an approved disinfection process and were used in the packing of wine and spirits.

In all cases in which the straw was employed as packing material it was a condition of the permit that such packing material should be destroyed under police supervision immediately after its arrival at its destination.

EXPORTATION OF HORSES.
Six mares and 16 geldings were exported from Northern Ireland during the period covered by this Report to the United States of America under authority of export certificates granted by the Ministry, and in addition similar certificates were issued in respect of one gelding for Canada and one gelding destined for France. Hunters are the type usually exported under such certificates.

EXPORTATION OF WOOL.
Certificates covering 529 bales of Northern Ireland wool being exported to the United States of America were issued by the Ministry, and similar certificates were also issued in respect of 24 bales destined for Italy.

This wool is certified to have been obtained from healthy Northern Ireland sheep, and the district in which it was produced is certified by the Ministry to be free from the more serious contagious animal diseases.

CARCASES WASHED ASHORE.
Five carcases washed up on Northern Ireland sea-coast were examined by Veterinary Inspectors of the Ministry and in all cases the Inspector was able to certify that on *post-mortem* examination no evidence of serious animal disease was observed.

APPROVED SHEEP DIPS AND DISINFECTANTS.

During the period under review 147 sheep dips, the majority of which are manufactured in Great Britain and the remainder in this country, received the Ministry's approval for use under the Sheep Scab (Northern Ireland) Order, 1930. Of these dips 109 are of the carbolic variety, whilst arsenic is the active ingredient in the remainder.

Disinfectants to the number of 35 have been approved by the Ministry for use under the provisions of the Animals Disinfection (Northern Ireland) Order, 1927, Amendment Order, 1931, referred to previously in this Report.

LIVE STOCK BREEDING ACT (NORTHERN IRELAND), 1922.

This Act has been in operation for almost eight years and the improvement in the cattle of the Province which was referred to in previous reports as resulting from the elimination of low-grade bulls under the Act has been maintained. During the year two general tours of inspection were carried out in the spring and autumn at a large number of centres and the inspection arrangements were announced as in previous years. The system of inspecting bulls for licences at the annual spring sales of the Royal Ulster Agricultural Society at Balmoral, Belfast; the North-West of Ireland Agricultural Society at Londonderry, and a few representative local sales was continued.

The results of the inspections are summarised in the following tables A and B :—

TABLE A.

Spring Inspections, 1931.

County.	Applications.	Licensed.	Rejected.	Withdrawn for various reasons, *e.g.*, under age.
Antrim	857	672	165	20
Armagh	394	282	102	10
Down	531	436	85	10
Fermanagh	331	252	71	8
Londonderry ..	489	374	92	23
Tyrone	856	630	197	29
TOTALS ..	3,458	2,646*	712	100

* Includes five bulls licensed on appeal.

TABLE B.

Autumn Inspections, 1931.

County.	Applications.	Licensed.	Rejected.	Withdrawn.
Antrim	484	394	74	16
Armagh	224	161	48	15
Down	240	196	30	14
Fermanagh ..	209	136	62	11
Londonderry ..	147	117	22	8
Tyrone	269	200	50	19
TOTAL ..	1,573	1,204*	286	83†

* Includes two bulls licensed on appeal.

† Of the 83 cases in which applications were withdrawn 48 were in respect of under-age bulls, 5 were slaughtered before inspection, 19 were castrated, 4 died and 7 were duplicate applications.

Of the 33 bulls referred to in the Ninth Annual Report as not having been inspected 24 were subsequently licensed, 4 rejected and 5 were castrated.

In 28 cases appeals were lodged against the Ministry's decision to refuse to grant licences under the Act. In 7 instances the appeals were upheld and licences granted. In one case the appeal was withdrawn and in the remaining 20 cases the original decision was confirmed and licences were finally refused.

Legal proceedings were instituted against 20 persons who persisted in keeping unlicensed bulls and in 19 cases convictions were secured. The remaining case was dismissed.

Permits were granted to owners of 208 bulls to enable them to retain the animals for a limited period to be fattened off for slaughter. Of these animals 157 have been slaughtered and in the remaining 51 cases the permits expire on the 31st December, 1931.

In the 90 cases where permits were unexpired at the date of the last report the animals were duly slaughtered within the time allowed.

HORSE BREEDING ACT (NORTHERN IRELAND), 1926.

In 1931 there were one Thoroughbred, one Clydesdale, five ponies and four hackneys fewer than in the previous year, while there was an additional half-bred stallion licensed, making in the aggregate a total of ten licensed stallions less than in 1930. The number of stallions offered for licences was 178—licences being granted in 167 cases and refused in the remaining 11 cases. In seven instances stallions were rejected for faulty conformation and in the remaining four cases for both unsoundness and faulty conformation. The present position in regard to these eleven rejected animals is shown in the following summary :—

8 castrated,
2 exported,
1 permit granted for draught purposes.

There was no appeal against the Ministry's refusal to grant a licence.

Twelve permits were granted, nine being to enable owners to use the stallions for draught or harness purposes, two for racing purposes and one for trotting. In one case a special licence was granted to enable the owner of the stallion to use the animal for the service of his own mares.

In one instance the Ministry felt obliged to institute proceedings against the owner of an unlicensed stallion and a conviction was secured.

In the following table a summary is given of the results of the inspections of stallions for licences in the past three years :—

County.	No. of applications for licences.			No. of licences granted.			No. of licences refused.		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Antrim ..	42	46	44	38	46	40	4	–	4
Armagh ..	16	22	20	15	18	19	1	4	1
Down ..	43	48	43	42	44	41	1	4	2
Fermanagh ..	17	20	20	15	18	18	2	2	2
Londonderry ..	33	33	35	29	30	33	4	3	2
Tyrone ..	18	22	16	16	21	16	2	1	–
TOTALS ..	169	191	178	155	177	167	14	14	11

The following table shows the number of stallions of each breed licensed in each county for the 1931 season :—

County.	Thoroughbred.	Clydesdale.	Suffolk Punch.	Irish Draught.	Hackney.	Pony.	Percheron.	Halfbred.	Total.
Antrim ..	6	13	3	–	2	5	1	10	40
Armagh ..	2	6	–	–	2	1	–	8	19
Down ..	21	10	–	–	–	–	–	10	41
Fermanagh ..	1	4	–	–	1	5	–	7	18
Londonderry ..	2	25	–	–	–	1	–	5	33
Tyrone ..	2	8	–	1	–	–	–	5	16
TOTALS ..	34	66	3	1	5	12	1	45	167

MARKETS AND FAIRS (WEIGHING OF CATTLE) ACTS, 1887 AND 1891.

During the period under review no cases of failure to comply with the provisions of the Acts came under notice.

DESTRUCTIVE INSECTS AND PESTS ACTS, 1877 AND 1907.

(*a*) *Destructive Insects and Pests* (*Northern Ireland*) *Order*, 1922.

During the year 419 consignments, mainly consisting of shrubs, bulbs, etc., imported chiefly from Holland, accompanied by the health certificates as required by the Order, were imported into Northern Ireland.

(*b*) *Sale of Diseased Plants* (*Northern Ireland*) *Order*, 1927.

The usual inspections of nursery stock exposed for sale in Belfast were carried out by the Ministry's Inspectors. Twelve sales of nursery stock were visited and, in addition, the county instructors in horticulture visited 12 auctions throughout the province. In no instance were diseased bushes found exposed for sale. With a view to ensuring a clean bill of health in the nurseries of the province periodic inspections were made by the horticultural instructors of the nurseries in their areas.

(*c*) *American Gooseberry Mildew and Black Currant Mite* (*Ireland*) *Order*, 1912.

During the year 7 licences were issued permitting the importation from England of approximately 2,500 gooseberry bushes and 700 black currant bushes.

In the course of their usual inspections a number of private gardens was visited and examined by the county instructors in horticulture. In only four cases was American Gooseberry Mildew found, as compared with 15 cases last year. In the majority of cases the bushes were treated by spraying, but in a few cases where the disease had reached too late a stage in its development the bushes were voluntarily destroyed.

A decrease in the number of cases of Black Currant Mite that came under notice is to be reported, the number being 19 compared with 45 for the previous year. In the majority of these cases the bushes were voluntarily destroyed.

(*d*) *Regulations affecting the Export of Plants.*

During the year the Ministry's Inspectors examined and issued certificates in respect of 259 consignments of plants, chiefly composed of rose trees and bulbs for export. The consignments were mainly sent to Canada and the United States.

Black Scab in Potatoes Orders.

Outbreaks of Black Scab Disease were found on a few holdings in the safety zone lying to the north of the scheduled area in County Londonderry, and as potatoes from this district were allowed to be moved to the Belfast market the Ministry, with a view to preventing the spread of the disease, made an Order which requires that only immune varieties may be planted in the area in question.

The Ministry also prohibited the movement of potatoes by motor lorry in the Ballycastle scheduled area, and these restrictions, together with the Black Scab Orders previously in force, were consolidated into one Order under the title of the Black Scab in Potatoes (Northern Ireland) (Consolidation) Order of 1930.

The fact that the farmers situated in the scheduled areas are beginning to realise the gravity of Black Scab disease is evidenced by the fact that in only 5 cases were legal proceedings found necessary for breaches of the Orders. Four of these cases were in respect of the illegal movement of potatoes from scheduled areas, the remaining case being one in which non-immune varieties were planted in an area where the planting of such varieties is prohibited. In each case a conviction was secured.

Potatoes Importation (Ireland) Order, 1920.

During the year 86 licences were issued under the provisions of the above-mentioned Order for the importation of 33 tons of seed potatoes from Great Britain.

FERTILIZERS AND FEEDING STUFFS ACT, 1926.

During the year three samples of fertilisers and 12 samples of feeding stuffs were drawn by the itinerant instructors in agriculture. In one instance the composition of a feeding stuff was found on analysis not to be in accordance with the guarantee given and the vendor of the feeding stuff was warned that if any further breach of the Act was brought to notice proceedings would be instituted.

On the whole, the state of the trade may be regarded as satisfactory.

BEE PEST PREVENTION (IRELAND) ACT, 1908.

The county instructors in bee-keeping visited 516 apiaries during the season. Over 1,750 stocks of bees were examined and 79 cases of Acarine Disease and 7 cases of American Foul Brood were discovered. In the cases of American Foul Brood the stocks were voluntarily destroyed and Frow's treatment was advised in the cases of Acarine Disease, except where the disease was too far advanced, in which cases stocks were voluntarily destroyed.

WEEDS AND AGRICULTURAL SEEDS ACTS (NORTHERN IRELAND), 1909 AND 1929.

(*a*) *NOXIOUS WEEDS.*

Police inspections were again carried out during the summer to secure the destruction of noxious weeds in Northern Ireland. The noxious weeds scheduled are ragwort, thistle, dock and ox-eye daisy. Operations under the Act were on the whole successful, and in only three cases was recourse to legal proceedings found necessary.

(*b*) *AGRICULTURAL SEEDS.*

As mentioned in the last report 25 samples were found unsatisfactory as a result of the analysis of the samples drawn in 1930. Eight of the samples were of such poor quality as to justify the publication of the particulars regarding same. In the remaining 17 cases the vendors were warned.

During the past spring 261 samples were drawn from seed exposed for sale throughout Northern Ireland. These samples on analysis were found to be up to standard in 228 cases, the remaining 33 samples revealing unsatisfactory features. These unsatisfactory cases are at present being considered and details as to the further action to be taken regarding them will be published in next year's Report.

SALE OF FOOD AND DRUGS ACTS, 1875 TO 1907.

The extent of the activities during the year ended 30th June, 1931, of the inspectors employed under the above-mentioned Acts by local authorities in Northern Ireland

in regard to samples of milk, buttermilk, butter, margarine and cheese is set out in the following table :—

Nature of sample.	No. of samples taken.	No. of prosecutions.	No. of convictions.	Penalties imposed (exclusive of costs).
				£ s. d.
Milk	3,004	74	34	44 3 6
Buttermilk ..	628	48	45	72 8 6
Butter	899	28	23	18 15 6
Margarine ..	303	–	–	– – –
Cheese	252	1	–	– – –
Totals	5,086	151	102	£135 7 6

Of the 151 prosecutions referred to above results from 13 are still pending and are not, therefore, available for publication. It will be noted that there is a slight decrease in these figures as compared with the previous 12 months which during that period were 5,106 samples, 190 prosecutions, 138 convictions, the total penalties imposed amounting to £171 2s. 0d.

During the period under review there were no fresh registrations under Section 9 of the Margarine Act and Section 7 (4) of the Sale of Food and Drugs Act, 1899, of premises used for wholesale dealings in margarine. The present distribution of such premises is as follows :—

County Borough of Belfast	116
,, Borough of Londonderry	10
,, Antrim	11*
,, Armagh	7
,, Down	6
,, Fermanagh	1
,, Londonderry	2
,, Tyrone	3

* Includes one Margarine Cheese Factory.

The provision of the Sale of Food and Drugs Acts, as stated in the Ministry's previous report, relating to the registration of butter factories with local authorities has been repealed and such premises must now be registered with the Ministry under the Marketing of Dairy Produce Act (Northern Ireland), 1929. The number of such premises in Northern Ireland at present is six.

Thirty-eight applications were received for approval under Section 8 of the Butter and Margarine Act for the use of fancy or descriptive names in connection with margarine. Approval was given for thirty-one names and withheld for the remaining seven names.

MARKETING OF EGGS ACTS (NORTHERN IRELAND), 1924-31.

Following the discussions with representatives of the shipping trade, referred to in the report for last year, the Ministry made arrangements to discuss with all licence holders under the Marketing of Eggs Acts the proposals on which general agreement with representatives of the shippers had been reached. Accordingly a series of meetings at provincial centres was arranged and each licence-holder invited to attend. It was explained that the Ministry proposed to inaugurate a systematic scheme of education amongst poultry-keepers with special reference to the requirements of the export trade, that the funds required for the employment of instructors should be provided by way of annual licence fees on an increased scale, and that in addition certain restrictions, intended to ensure that the minimum of delay would take place in the commercial channel from the farm to the British market, would be placed on traders. Estimates of the losses on eggs below marketable quality could not be accurately determined but such figures as were available went to prove that, if but a small proportion of the loss could be avoided, the trade would be amply recouped for the increased licence fees. The meetings were well attended and agreement with the Ministry's suggestions was unanimous.

The Marketing of Eggs Act (Northern Ireland), 1931, embodying the suggested amendments is now on the Statute Book and its provisions may be summarised shortly as follows :—

Licences.—Licences are renewable annually and are divided into two classes.

" Class A," being a licence for the purchase of eggs and the disposal thereof after having been tested, graded and packed in accordance with the prescribed conditions ;

" Class B," being a licence for the purchase of eggs and the disposal thereof to other wholesale dealers in accordance with conditions to be prescribed.

The fees payable for licences were fixed as follows :—

Class A : £3 0s. 0d. together with a fee of not more than one penny in respect of each case of eggs (30 dozen) dispatched to Great Britain, the Irish Free State or the Isle of Man. (The fee per case is at present one half-penny).

Class B. : £1 0s. 0d.

Records and Returns.—In order to determine the amounts payable by Class " A " licence holders in respect of consignments exported it was necessary to provide for the keeping of records and the furnishing of returns. These figures will be of very considerable statistical value to the Ministry and to the trade.

Registration of Premises.—All premises owned or occupied by a licensed wholesale dealer for the purposes of his trade must be registered with the Ministry. This provision had been rendered necessary by the irregular use by certain members of the trade of premises of which the Ministry had no knowledge.

Inspection of Eggs in Transit.—Certain amendments to the existing powers, which had been proved by experience to be desirable, were provided under this heading.

Exports by Poultry-Keepers.—Some considerable expansion of direct trading between producers in Northern Ireland and customers in Great Britain and elsewhere having taken place in recent years, the opportunity was taken to place such trade on a regularised basis. A poultry-keeper exporter must now hold a permit, issued free of cost by the Ministry, and consignments sent by him are subject to inspection in order to ensure that the eggs are clean and fresh.

Prosecutions.—Cases taken under the Acts must now be heard before a resident magistrate sitting alone or with other resident magistrates.

The Act became operative as from the 1st September, 1931, and as from the previous day all existing licences were deemed by the Act to have ceased to have effect. In future licences will lapse, unless previously revoked by the Ministry, on the 31st August of each year.

The main purpose of the Act being to enable the Ministry to develop its educational activities amongst poultry-keepers, it was considered desirable to put officers in the field at the earliest possible date during the season of maximum production. Authority was, accordingly, obtained to anticipate the income which would commence as from the effective date of the Act and six educational officers were engaged at various dates in the preceding July. Two of these officers were engaged on all-the-year-round terms, and the remainder until the 30th September. The most effective means of utilising the services of these officers could only be determined by experiments made. Each instructor was placed for about two months in one district and the following methods adopted :—

(*a*) The instructor visited the stores of merchants in his area, and from the information so obtained visited the farms from which defective eggs had been obtained.

(*b*) The instructor accompanied a collector on his itinerary, examined the eggs as offered and gave instruction as was found necessary.

(*c*) The instructor made house to house visits to all poultry-keepers in his district, examined any eggs on hands and gave instruction on such aspects of the work as housing, provision of suitable nests, proper methods of ensuring cleanliness.

From the experience so gained it became apparent that the house to house visits promised the greatest return and for the coming season this will be the procedure to be followed. In general also the Ministry is confident that the inferiority of the supplies marketed by poultry-keepers is in most cases due to a lack of knowledge and that the extension of personal canvass on the marketing requirements will have good results. In the areas covered so far, encouraging improvement in quality as a whole has been reported by the local licence holders and the Ministry's officers testify to a readiness on the part of the producer to improve methods once the necessity for them has been explained.

In all cases the importance of marketing infertile eggs only was stressed and encouraging progress was made in this respect.

The maximum benefit will not, of course, be experienced until the full staff of instructors has been employed and the ground covered. It is hoped to have ten instructors in the country during the period April to September inclusive, in addition to the two officers employed for the full year.

The amended legislation should help considerably to prevent supplies from being delayed unduly in the hands of the wholesale trade. In the first place the collector can sell only to a Class " A " licence holder, that is, for all practical purposes, to the shipper. Furthermore all licence holders of either class must test, except during February and March, the option of exemption from testing being offered to any Class " B " licensee on conditions which necessitate his passing on supplies at least twice a week. The pernicious practice of buying and selling amongst collectors is thus avoided. Greater stress will be laid on compliance with the regulations in regard to identification in order that the Ministry's officers will be enabled to trace the fault right back to the producer. For this reason mainly it has been provided that the system must be maintained in operation all the year round.

AMENDMENT OF THE RULES.

The passing of the Marketing of Eggs Act, 1931, necessitated a revision of the existing Rules and the following is a summary of the more important amendments.

Premises.—The conditions attaching to Registration of Premises were set out in detail. The distinction previously drawn between Class A premises and Class B premises was discontinued, and in its stead it is now required that eggs may not be removed from registered premises by the holder of a Class A licence unless they are tested, graded and packed for sale or are packed in cases marked " Collection Only." Eggs removed from registered premises by the holder of a Class B licence must be packed in cases marked " Collection Only."

In addition to the existing conditions as to suitability of the building and adequacy of the equipment it was provided that the applicant or, at least, one person employed by him must have adequate knowledge and experience of testing. An exception is made where the applicant is exempted from testing under a later Article.

Fees.—The fees payable in respect of consignments of eggs despatched to Great Britain, the Irish Free State or the Isle of Man by the holder of a Class A licence were fixed at one half-penny per thirty dozen eggs and the amounts due are to be payable quarterly on the 30th November, 28th or 29th February, 31st May and 31st August, respectively.

Records and Returns.—In order that the charges for fees may be computed it was prescribed that Class A licence holders should keep records of all consignments to which fees applied and furnish the Ministry with returns of the necessary information. As regards the records the Ministry intimated to the trade that so long as the books kept for the ordinary purpose of the licence holder's business showed the requisite information clearly no special form of record would be required. Returns were, however, regarded in a more important light, and the following arrangements were completed. Each licence holder was supplied with copies of forms, serially numbered, on which the particulars as to the quantity and destination of the consignment were entered. This form, when completed, is handed to the carrying company with the consignment to which it refers and is collected by the shipping company at the port of shipment for

transmission to the Ministry. Where such a form does not accompany the consignment the shipping company notifies the Ministry as to the name of consignor and quantity of eggs included in the consignment. It is on the information provided by these forms that the accounts for fees due by shippers are made up.

The Ministry desires to take this opportunity to express its gratitude to the carrying companies for the ready way in which they have co-operated with the Ministry in dealing with these forms.

Testing.—The period during which eggs must be tested was extended to cover the months of April to the following January inclusive. This step was rendered necessary by experience of the proportion of eggs of unsatisfactory quality found to be passing during the months of January and April.

All licence holders are required to test, exemption being offered to Class B licence holders on certain conditions. The exempted person must sell all his supplies within three days from the day of collection to a Class A licence holder or, if specially authorised, to a Class B licence holder who is not exempted from testing. This arrangement provides for supplies to be tested at the earliest practicable moment after collection and prohibits the most unsatisfactory practice of buying and selling between collectors.

The seller in such instances must enclose a docket in the case bearing his name and address or licence No. and the date of despatch from his premises and the purchaser must test the eggs within 48 hours from the time of receipt.

Packing.—The only amendment of note under this heading makes it clear that buying for resale, whether by retail or wholesale, and packing incidental thereto must be done under cover.

Itinerant Collection.—The exposure to the weather of eggs purchased by itinerant collectors has long been a source of trouble and in order to preserve the cleanliness and quality it is now required that vehicles shall be provided with a hood so that the process of buying and packing can be done under shelter.

Identification.—Identification is now required all the year round, and not, as formerly, during the testing period only. The object of this requirement is to facilitate the work of the Ministry's instructors who propose to make extensive use of the identification dockets in their educational work amongst poultry-keepers.

Permits.—Consignments shipped by poultry-keepers under permit must consist wholly of eggs produced by fowl owned by the permit holder, must be capable of being opened in transit for inspection purposes and must be packed in suitable cases.

MARKETING OF POTATOES ACT (NORTHERN IRELAND), 1928.

The number of merchants licensed to export potatoes under the above-mentioned Act is now 216.

During the shipping season of 1930–31 approximately 132,000 tons were inspected and certified prior to export. This figure compares very favourably with the previous season, when only 70,000 tons approximately were exported. The increase this year is due to the fact that in 1929 the potato crop in Great Britain and on the Continent was particularly heavy, with the result that a poor demand for potatoes from Northern Ireland was experienced in that year. The exports in the 1930–31 season, however, were more comparable with the exports for the 1928–29 shipping season, when some 136,000 tons were exported.

The potatoes exported were sent to the following countries :—

	Tons.
England and Wales	111,600
Scotland	8,500
Malta	3,200
Spain	1,500
Irish Free State	5,500
Channel Islands	800
Other Countries	400

The Marketing of Potatoes Act has resulted in potatoes being shipped in a condition that commands the confidence of cross-channel merchants, and the work of inspection has undoubtedly led to an increased demand and to better prices being obtained for Northern Ireland potatoes. As showing the commercial value of a compulsory grading system it may be observed that, although the Ministry's statutory rules provide for the cessation of inspection for export at the end of May in each year, leading merchants appealed to the Ministry to have inspection continued for a further period, and this request was granted.

INSPECTION OF GROWING CROPS OF POTATOES.

The voluntary inspection of growing crops of potatoes in non-scheduled areas, which has been in operation since 1922, was again carried out during the year. Both immune and non-immune varieties were inspected and certificates were issued in respect of 3,623 acres of immune varieties and 5,029 acres of non-immune.

All crops of potatoes planted in scheduled areas are also inspected when growing and certificates issued as to the purity of crops which reach the requisite standard. In cases where non-immune rogues are detected in any crop the owner is required to dig up such rogues before the crop is certified.

The crop inspection scheme has resulted in merchants being now in a position to supply seed potatoes of a high standard of purity and true to name of variety for both foreign and home orders. It is pleasing to record that very favourable reports have been received from buyers of Northern Ireland seed potatoes.

MARKETING OF DAIRY PRODUCE ACT (NORTHERN IRELAND), 1929.

This Act received the Royal Assent on the 19th December, 1929, and came into operation on the 1st January, 1931. The main provisions of the Act and the Rules made thereunder relate to (1) the registration of premises where butter is manufactured, blended, or assembled for export; (2) the conditions under which butter is manufactured at registered premises, and (3) the markings to be applied to packages of butter for export. Four different classes of premises are liable for registration, namely, Auxiliary Creameries, Central Creameries, Butter Factories and Wholesale Depots, and in order to assist owners of premises to decide as to which class of registration would best suit the requirements of their trade the Ministry arranged for the holding of a series of three conferences in November and December, 1930, at Omagh, Enniskillen and Coleraine, with managers of creameries and others interested in the butter industry at which the requirements and implications of the Act and Rules in regard to registration and other matters were fully explained.

In the case of auxiliary and central creameries the essential conditions for registration are (1) structural suitability of the buildings, (2) adequate machinery and equipment, (3) sufficient water supply, (4) cleanliness, and (5) qualified employees. Having regard to the depressed state of farming generally and also to the special difficulties of the creamery industry during the year, the Ministry decided to insist only on improvements in buildings and equipment which were absolutely necessary. In the great majority of cases the Ministry's requirements were readily complied with and only in two cases were creamery committees obliged to obtain loans from the Ministry, the total amount granted being £1,100. On the whole the Act has so far worked smoothly and the interests concerned have made a gratifying response to the demands of the Ministry.

The registrations effected since the 1st January, 1931, were as follows :—

Auxiliary Creameries	77
Central Creameries	33
Butter Factories	4
Wholesale Depots	7

In accordance with the Marketing of Dairy Produce (Surprise Inspections of Butter) Rules (Northern Ireland), 1931, twelve inspections of butter samples were held by the Ministry during the period under review. The selected centres for examination of the samples were Belfast, Coleraine, Enniskillen, Glasgow and Omagh, and of the total of 404 samples submitted by central creameries and butter factories 336, or 83 per cent., were awarded " Premium " or " Standard " marks by independent

judges appointed by the Ministry. In explanation of the fact that only one inspection was held in Great Britain it may be mentioned that last season the bulk of the output of the creameries and factories was being marketed in Northern Ireland and consequently no useful purpose would have been served by arranging a series of inspections and exhibitions at cross-channel centres as in previous years.

As a result of representations made to the Ministry in December, 1930, that a number of creameries had in their possession stocks of butter boxes and wrappers which would take some time to dispose of, the Ministry decided to postpone until the 1st April, 1931, the operative date of Article X of the Marketing of Dairy Produce Rules (Northern Ireland), 1930, relating to the marking and packing of boxes of butter for export. Central creameries and butter factories were thus enabled to use up existing stocks of boxes and wrappers and to order new supplies. It was subsequently found necessary to amend Article X so as to permit of the code markings being made on parchment liners and wrappers by means of stamping as an alternative to perforating, and also to provide for the marking of the number of the churning on the outside of packages and on vegetable parchment wrappers.

The whole question of the recognition of the qualifications and appointment of employees in auxiliary and central creameries under Section 2 (f) of the Act has been receiving the careful consideration of the Ministry and the necessary statutory regulations will be issued early in 1932. The main provisions of the proposed regulations were discussed with representatives of auxiliary and central creameries at a conference held on the 20th October, 1931, and were subsequently considered by the Ministry's Advisory Committee on Dairying. Briefly, the regulations will discriminate between persons employed at the date of the passing of the Act, viz., 19th December, 1929, and those appointed subsequent to that date and definite standards of qualifications for the posts concerned will be prescribed. The Committees of Management will be required, before making any appointment to the position of manager, assistant manager or butter-maker, to submit to the Ministry the applications of those persons from whom it is proposed to make the appointment and it will be for the Ministry to decide whether the applicants hold the qualifications necessary for appointment.

AGRICULTURAL PRODUCE (MEAT REGULATION) ACT (NORTHERN IRELAND), 1930,

The above-mentioned Act, to the passing of which reference was made in the Ministry's last Annual Report, came into operation on the 1st May, 1931, and has been working very satisfactorily. Licences to export fresh meat have been issued to 40 persons who have made arrangements for the slaughter of animals on registered premises where examination of the animals is made by a Veterinary Inspector of the Ministry both before and after slaughter.

Licences to carry on the business of curing bacon and hams have been issued to 97 persons.

MARKETING OF FRUIT ACT (NORTHERN IRELAND), 1931.

As pointed out in the Ministry's Annual Report for last year further consideration of the Marketing of Fruit Bill, which received a first reading in July, 1930, was postponed by Parliament until the spring session of 1931 so that there might be further discussion with the interests concerned. The provisions of the Bill were subsequently fully considered by the Ministry's Advisory Committee in connection with the grading and marketing of fruit and, in addition, representative deputations of fruit growers were received and given an opportunity of placing before the Ministry their views regarding the various features of the Bill. Further a leaflet explaining fully the main provisions of the legislation was extensively circulated amongst fruit growers.

The Bill was reintroduced during the 1931 spring session of Parliament and on the 26th day of May, 1931, the measure received the Royal Assent.

Briefly, the Act provides as follows :—

(1) That merchants exporting fruit to Great Britain or the Isle of Man must be licensed, must pay an annual fee of £1 and must grade and pack fruit exported by them in accordance with the prescribed standards.

(2) That growers may receive permits free of charge to export to Great Britain or the Isle of Man fruit grown by them provided such fruit is graded up to the same standards as are applicable to licensed merchants.
(3) That permits may be given free of charge for the export of ungraded fruit for manufacturing purposes.
(4) That packages of fruit, whether for sale within Northern Ireland or for export, must not be " topped."
(5) That a voluntary scheme may be set up under which the Ministry may prescribe designations to indicate the quality, grading and packing of any class of fruit grown in Northern Ireland and sold within Northern Ireland. Any person selling fruit under a grade designation in effect gives a guarantee to the purchaser that the fruit is up to the standard indicated by the grade designation.

The Ministry has issued a Guide to the Act which gives full particulars as to requirements and copies of this Guide may be had free on application.

MERCHANDISE MARKS ACTS, 1887 TO 1926.

The position regarding agricultural and horticultural products which have been dealt with in Orders in Council under the Merchandise Marks Act, 1926, remained unaltered during the year ended 30th June, 1931, and consists of the following :—

(1) Honey.
(2) Fresh Apples.
(3) Eggs in shell and dried eggs.
(4) Currants, Sultanas and Raisins.
(5) Oats and oat products.
(6) Tomatoes.
(7) Rose Trees.
(8) Malt products.

Mention was made in the Ministry's previous Report of an Order in Council to require the marking of imported butter. This Order requires the marking of an indication of origin in the case of all blends or mixtures of butter which consist of or contain imported butter. It is anticipated that the Order will become operative towards the middle of 1932.

APPENDIX III.

Page.

Table giving details of the centres at which Winter Agricultural Classes were held in each county of Northern Ireland and the number of students attending at each centre 76

List of Ministry's Leaflets and Other Publications 77

Table giving particulars regarding the demonstration plots laid down and the general work of the Itinerant Instructors in Agriculture and Overseers in each of the six counties 79

Table giving particulars regarding the demonstrations carried out by the Itinerant Instructors in Agriculture and Overseers in regard to the improvement of pastures by the inclusion of wild white clover with a good seeds mixture and by the application of suitable manures, particularly phosphates 80

Table giving particulars of the various experiments on the treatment of crops carried out by the Itinerant Instructors in Agriculture 80

Table showing operations under the Scheme of Instruction in Poultry-keeping during 1930–31 80

Table showing the main conditions governing the award of premiums to holders of Poultry Stations 81

Table showing the number of Egg Distribution Stations, the number of sittings of eggs distributed, the number of Turkey Stations and the number of turkey hens mated in each county during 1930–31 81

Table showing the number of Poultry Stations in each county at which trap-nesting was carried out during the winter of 1930–31, together with corresponding figures for the two previous years 81

Table showing the number of Poultry (hen and duck) Stations by Breeds, and the number of sittings of eggs distributed in 1930–31 82

Table showing the amounts expended by County Committees on premiums to holders of Poultry Stations under the Scheme for the Improvement of Poultry in 1931 83

Table illustrating the work performed by the Instructors in Butter-making and Home Cheese-making during 1930–31 83

Table giving particulars of the work performed in connection with the Scheme of Instruction in Horticulture and Bee-keeping during 1930–31 83

Table showing the nature of the experiments carried out by the Instructors in Horticulture during 1930–31 84

Table showing the number of holdings entered for the " Prizes for Cottages Competition in Rural Districts," together with the number and total value of the prizes awarded 84

Table giving particulars of the grants made by each County Committee for the purpose of assisting the promotion of Agricultural Shows, Ploughing Matches, etc., during 1930–31 84

Table showing the amounts allocated and expended by the several County Committees, together with the distribution of premiums for stallions in the various counties 85

Table showing the values of premiums for stallions adopted by each County Committee in 1931 85

Table showing the number of mares served by each class of stallion in 1931 .. 85

Table showing the number of licensed stallions in each year from 1923 86

Table showing the regulations made by the several County Committees in regard to service fees for cows, etc. 86

Table showing the amounts allocated by County Committees for premiums to bulls in 1931 and the estimated expenditure in each county 86

Table giving particulars of the bulls selected for and awarded ordinary premiums under the Cattle-breeding Scheme in 1931 87

Table giving particulars of the distribution of " Special term " bulls in 1931 .. 87

Table showing the number of bulls standing for service in Northern Ireland in 1931 under the Cattle-breeding Schemes 87

Table showing the minimum qualifying standards for registration of dairy cows—ordinary and advanced 88

Page.

Table illustrating the minimum registration yields required in the case of cows which failed to produce a calf within the fourteen months' period, but calved within sixteen months from the previous date of calving, and the deductions which are made when entering particulars in the Register .. 88

Table showing yields of pure-bred and non-pedigree cows registered by the Ministry from 1st October, 1930, to 30th September, 1931 88

Table showing the yields of pure-bred and non-pedigree cows registered by the Ministry during the period 1st January, 1922, to 30th September, 1931 89

Table showing the number of Milk Recording Associations in Northern Ireland from 1921 to 1931 89

Table showing the number of members of Milk Recording Associations in Northern Ireland from 1921 to 1931 89

Table showing the number of cows entered in Milk Recording Associations in Northern Ireland from 1921 to 1931 90

Table showing the number and value of premiums awarded for boars in each of the six counties by the several County Committees in 1931 .. 90

Table showing the amounts allocated for premiums to boars and the estimated expenditure in each county 90

Table showing the operations of the Sheep-breeding Scheme in mountainous districts 91

Table illustrating the operations of the Sheep-breeding Scheme in lowland districts 91

Grants to Associations apart from grants made to Agricultural Show Societies through County Committees 91

Officials of County Committees of Agriculture 92

Educational Exhibits at Shows 93

Table giving details of the centres at which Winter Agricultural Classes were held in each county of Northern Ireland, and the number of students attending at each centre :—

County.	No. of centres.	Centres.	No. of Students enrolled.
Antrim	4	Ballymena	16
		Bushmills	7
		Ballycarry	10
		Magheragall	15
Armagh	2	Jerrettspass	13
		Mullahead	12
Down	4	Ballynahinch	14
		Hillsboro'	19
		Castlewellan	30
		Rathfriland	18
Fermanagh ..	2	Irvinestown	11
		Kinawley	17
Londonderry ..	2	Grove	18
		Tamlaght O'Crilly	12
Tyrone	5	Loughmacrory	22
		Newtownstewart	15
		Donemana	23
		Cookstown	14
		Rock	20

LIST OF MINISTRY'S LEAFLETS AND OTHER PUBLICATIONS.

No. 1. Flax Seed.
„ 2. Improvement of Farm Poultry.
„ 3. Feeding for Egg Production.
„ 4. Marketing of Eggs.
„ 5. Dishorning Calves.
„ 6. The Packing of Apples in Standard Boxes.
„ 7. Potato Experiments.
„ 8. Seed Testing for Farmers.
„ 9. The Renovation of Orchards.
„ 10. Fruit Tree Pests—Capsid Bugs.
„ 11. Fruit Tree Pests—Aphides and Apple Suckers.
„ 12. Fruit Tree Pests—Caterpillars.
„ 13. Contagious Abortion in Cattle.
„ 14. Cheese-making on the Farm.
„ 15. Suitable Varieties of Fruit.
„ 16. The Feeding of Dairy Cows.
„ 17. Home Bottling of Fruits and Vegetables.
„ 18. Marketing of Dead Poultry.
„ 19. How to Feed Linseed to Calves.
„ 20. The Hatching and Rearing of Chickens.
„ 21. A Portable Poultry House for the Farm.
„ 22. Leather-Jacket Grubs.
„ 23. The Handling and Care of Wool.
„ 24. Fluke in Sheep.
„ 25. The Rearing and Management of Young Horses.
„ 26. Ordnance Survey Maps for Farmers.
„ 27. Clean Eggs.
„ 28. The Construction of a Laying House for Poultry.
„ 29. The Selection and Breeding of Laying Hens.
„ 30. The Feeding of Steamed Bone Flour to Farm Stock.
„ 31. Coccidiosis in Poultry.
„ 32. Roup of Poultry.
„ 33. Spraying Calendar for Apple Orchards.
„ 34. The Pruning of Apple Trees.
„ 35. The Fattening of Pigs.
„ 36. Advantages of Milk Recording.
„ 37. The Raising and Fattening of Turkeys.
„ 38. The Destruction of Charlock.
„ 39. The Production of Clean Milk.
„ 40. The Laying Down and Management of Temporary Pastures.
„ 41. Blackleg, Blackquarter, or Quarterill.
„ 42. The Compounding of Balanced Rations for Dairy Cows.
„ 43. Tuberculosis in Poultry.
„ 44. Results of Crop Experiments.
„ 45. The Breeding and Rearing of Pigs.
„ 46. Hints for Winter Egg Production.
„ 47. The Care and Management of Sheep.
„ 48. Baby Beef Production.
„ 49. American Gooseberry Mildew.
„ 50. Potato Blight.
„ 51. Butter-making on the Farm.
„ 52. Gapes in Chickens.
„ 53. Grade "A" (Tuberculin Tested) Milk.
„ 54. Breeding and Rearing of Calves.
„ 55. Destruction of Ragwort or Benweed.
„ 56. Identification of Egg Supplies.
„ 57. The Importance of Quality in Egg Production.
„ 58. Fertilisers and Feeding Stuffs.
„ 59. Bacillary White Diarrhoea.
„ 60. Winter Agricultural Classes.
„ 62. The Production of Timber on the Farm.
„ 63. Sheep—Castration, Docking, Foot-rot and Care of Feet.

No. 64. The Destruction of the Maggots of the Ox Warble Fly in Cattle.
„ 65. The Packing of Apples in Barrels.
„ 66. Seed Testing Facilities for Traders.
„ 67. Vegetable Growing.

CIRCULARS.

No. 1. Phosphatic Fertilisers.
„ 2. Fertilisers and Feeding-Stuffs Act, 1926—Decorticated Cotton Cake.
„ 3. Why Pay a Tax on the Horns of Cattle ?
„ 6. Farm and Garden Pests—Remedies and Preventives.
„ 8. Basic Slag.
„ 9. Smut in Oats.
„ 10. Purchase of Fertilisers and Feeding Stuffs.
„ 245. War on Weeds.

TALKS TO PRODUCERS.

No. 1. Standardise, Organise, Advertise.
„ 2. Winter Eggs from Pullets.
„ 3. Feeding Layers for Profit.
„ 4. Cull the Loafers.
„ 5. Good Housing means more Eggs in Winter.
„ 6. The Ten Commandments of High Egg Production in Winter.
„ 7. How to Increase the Profits from Dairy Cows.
„ 8. Higher Yields of Potatoes.
„ 9. A Few of the Things the Purchaser Wants.
„ 10. Use the Dairy By-Products Efficiently.
„ 11. Make the Farm Self-contained.
„ 12. The Secrets of Winter Egg Production.
„ 13. Reducing the Cost of Pork Production.
„ 14. Money from Early Spring Chickens.
„ 15. Produce First Quality Eggs.
„ 16. Table Ducklings are Money Makers.
„ 17. Continued Effort Pays in Pork Production.
„ 18. Produce the Quality of Pork the Consumer Demands.
„ 19. Hornless Store Cattle bring best Prices.
„ 20. Grow more Oats and Feed more Stock.
„ 21. Pure-bred Sires produce Superior Progeny.
„ 22. More Money from Apples.
„ 23. The Farm Poultry Flock as a Money Maker.
„ 24. Good Cockerels are Cheap.
„ 25. Reduce Calf Rearing Costs.
„ 26. Important News for Chicken Rearers.
„ 27. How to get Large-sized Turkeys.
„ 28. The Ten Commandments of Profitable Apple Production.
„ 29. Marketing of Honey.
„ 30. Good Sized Pullets lay Good Sized Eggs.
„ 31. The Superfluous Cockerel is an Expensive Luxury.
„ 32. How to Obtain Large Apples.

TALKS TO CONSUMERS.

„ 1. Let's have Eggs and Good Health.

MISCELLANEOUS PUBLICATIONS.

Farmers and Income Tax.
Store Cattle.
Reports of Egg-Laying Tests.
Crop Insurance.
Lists of Growers of certified crops of Immune and non-Immune varieties of Potatoes.
The Ministry's Monthly Report.
Register of Premium Stallions.
A Potato Chute for the Farm.

Any of the above publications may be obtained free of charge and post free on application to the Secretary, Ministry of Agriculture, Stormont, Belfast.

The following publications can be obtained from His Majesty's Stationery Office, 15, Donegall Square West, Belfast :—

(1) The Annual Report of the Ministry of Agriculture for Northern Ireland. Price 2/6 net.

(2) The Annual Report upon the Agricultural Statistics of Northern Ireland. Price 2/- net.

(3) The Journal of the Ministry of Agriculture for Northern Ireland. Price 2/6 net.

(4) The Agricultural Output of Northern Ireland (1925). Price 2/6 net.

Table giving particulars regarding the demonstration plots laid down and the general work of the Itinerant Instructors in Agriculture and Overseers in each of the six counties :—

AGRICULTURAL INSTRUCTORS.

County.	Instructors employed.	Farms visited.	Lectures delivered.	Attendances at lectures.	No. of field experiments carried out.	No. of demonstrations laid down.
Antrim ..	2	785	15	754	40	160
Armagh ..	1	636	9	292	19	35
Down ..	2	919	14	641	38	125
Fermanagh	1	839	8	187	13	121
Londonderry	1	573	7	180	19	82
Tyrone ..	3	1,701	25	1,131	35	170
Totals ..	10	5,453	78	3,185	164	693

AGRICULTURAL OVERSEERS.

County.	Overseers employed.	Farms visited.	No. of demonstrations laid down.
Antrim	2	2,259	242
Armagh	2	2,188	213
Down	2	1,168	242
Fermanagh	3	2,581	346
Londonderry	3	3,406	262
Tyrone	4	3,677	390
Totals	16	15,279	1,695

The foregoing figures include demonstrations with wild white clover and phosphatic manures, details of which are given in the following table :—

Table giving particulars regarding the demonstrations carried out by the Itinerant Instructors in Agriculture and Overseers in regard to the improvement of pasture by the inclusion of wild white clover with a goods seeds mixture and by the application of suitable manures, particularly phosphates :—

County.	Wild White Clover. Number of plots.			Phosphatic Manure. Number of plots.		
	1928–29.	1929–30.	1930–31.	1928–29.	1929–30.	1930–31.
Antrim	164	174	95	107	137	71
Armagh	81	58	64	72	73	75
Down	115	104	102	97	73	89
Fermanagh	31	54	77	159	179	147
Londonderry	109	114	122	124	91	92
Tyrone	219	107	167	200	225	124
Totals	719	611	627	759	778	598

Table giving particulars of the various experiments on the treatment of crops carried out by the Itinerant Instructors in Agriculture :—

Experiments.	Manurial experiments	Variety of seeds experiments	Liming experiments	Others.	Total.
Potatoes ..	22	27	–	–	49
Turnips ..	–	17	–	7	24
Mangels ..	–	9	–	–	9
Oats	8	30	–	11	49
Wheat	3	5	–	–	8
Hay	11	–	–	–	11
Wild White Clover	–	–	–	6	6
Grazing ..	–	–	8	–	8
Totals ..	44	88	8	24	164

Table showing operations under the Scheme of Instruction in Poultry-keeping during 1930-31 :—

County.	No. of instructors.	No. of lectures.	No. of visits.	No. of courses of instruction given.	No. of daily classes in these courses.	No. of pupils on class attendance register.
Antrim ..	2*	18	1,222	—	—	—
Armagh ..	1*	8	825	1	16	20
Down ..	2*	8	1,220	1	15	18
Fermanagh ..	1	8	880	—	—	—
Londonderry ..	2*	12	1,745	3	45	54
Tyrone ..	2	9	1,234	5	74	86
Totals ..	10	63	7,126	10	150	178

* Employed also as instructor in butter-making.

Table showing the main conditions governing the award of premiums to holders of Poultry Stations :—

Station.	Maximum Premium Payable.	No. of sittings to be distributed.	No. of eggs in sitting.	Average price per sitting.
	£			s. d.
Hen or Hen and Duck ..	7	70	12	2 6
Goose	2	12	3	3 0
Turkey ..	3	20 hens to be served at a fee not exceeding 1/- per service.		

Table showing the number of Egg Distribution Stations, the number of sittings of eggs distributed, the number of Turkey Stations and the number of turkey hens mated in each county during 1930–31 :—

County.	No. of egg distribution stations.		Sittings of eggs distributed. (12 Eggs per sitting)	No. of egg distribution stations (goose).	Sittings of eggs distributed. (3 Eggs per sitting)	No. of turkey stations.	No. of hens mated.
	Hens only.	Hens and Ducks.					
Antrim ..	42	25	10,745	18	284	77	2,368
Armagh ..	23	11	3,695	16	248	52	2,132
Down ..	55	8	11,464	12	179	82	2,783
Fermanagh ..	22	28	4,177	20	301	59	2,616
Londonderry	44	14	6,259	23	353	60	2,378
Tyrone ..	56	13	7,329	31	402	95	4,013
Totals ..	242	99	43,669	120	1,767	425	16,290
Totals for 1929-1930 ..	251	101	40,552	125	1,818	440	17,107

Table showing the number of Poultry Stations in each county at which trapnesting was carried out during the winter of 1930–31, together with corresponding figures for the two previous years :—

County.	1928–29.	1929–30.	1930–31.
Antrim	9	13	14
Armagh	4	5	4
Down	8	12	11
Fermanagh ..	2	2	2
Londonderry ..	9	10	13
Tyrone	6	9	8
Totals ..	38	51	52

Table showing the number of Poultry (Hen and Duck) Stations by Breeds and the number of sittings of eggs distributed in 1930–31 :—

Breed.	Antrim.		Armagh.		Down.		Fermanagh.		Londonderry.		Tyrone.		Totals.	
	No. of Stations.	No. of Sittings.	No. of Stations.	No. of Sittings.	No. of Stations.	No. of Sittings.	No. of Stations.	No. of Sittings.	No. of Stations.	No. of Sittings.	No. of Stations.	No. of Sittings.	No. of Stations.	No. of Sittings.
Hens :														
White Wyandotte ..	26	3,925	12	1,118	24	4,414	17	1,176	18	1,737	28	2,742	125	15,112
White Leghorn ..	16	3,188	7	934	10	1,833	14	1,039	16	1,722	5	590	68	9,306
Barred Plymouth Rock	2	179	–	–	–	–	1	87	–	–	2	135	5	401
Black Leghorn ..	–	–	–	–	–	–	1	80	–	–	–	–	1	80
Black Minorca ..	–	–	1	97	1	76	3	231	1	100	–	–	6	504
Light Sussex ..	1	120	3	267	5	599	3	293	5	414	5	425	22	2,058
Rhode Island Red ..	23	3,561	11	1,195	23	4,316	8	754	18	2,095	29	3,207	112	15,128
Ancona	–	–	–	–	–	–	3	203	–	–	–	–	3	203
Ducks :														
Indian Runner ..	4	22	–	–	1	12	2	11	–	–	1	5	8	50
Khaki Campbell ..	11	116	3	18	3	56	6	50	6	49	2	50	31	339
Aylesbury	9	150	5	85	3	147	4	54	5	99	3	77	27	612
Fawn and White Runner	2	22	2	39	1	11	16	196	3	42	7	97	31	407
Totals	–	11,283	–	3,753	–	11,464	–	4,174	–	6,258	–	7,328	–	44,200
Totals for 1929–30 ..	–	10,552	–	4,037	–	8,685	–	4,342	–	6,256	–	6,680	–	40,552

Table showing the amounts expended by County Committees on premiums to holders of Poultry Stations under the Scheme for the Improvement of Poultry in 1931:—

County.	Hen or hen and duck stations.	Goose stations.	Turkey stations.
	£ s. d.	£ s. d.	£ s. d.
Antrim	513 19 4	35 12 2	206 7 9
Armagh	236 2 6	32 0 0	138 3 9
Down	427 10 0	21 16 8	221 16 3
Fermanagh ..	335 13 0	40 0 0	158 5 3
Londonderry ..	376 10 9	46 0 0	165 0 0
Tyrone	516 15 0	54 14 5	261 5 0

Table illustrating the work performed by the Instructors in Butter-making and Home Cheese-making during 1930-31 :—

County.	No. of instructors.	No. of lectures.	No. of visits to private dairies.	No. of courses of instruction given.	No. of daily classes in these courses.	No. of pupils on attendance register.
Antrim ..	2	–	*	1	13	12
Armagh ..	1	–	*	1	16	9
Down ..	2	–	*	2	40	19
Londonderry	2	–	*	2	30	20
Totals ..	7	–	*	6	99	60

* Included in the number of visits furnished in connection with the Scheme of Instruction in Poultry-keeping.

Table giving particulars of the work performed in connection with the Scheme of Instruction in Horticulture and Bee-keeping during 1930-31 :—

County.	No. of instructors employed.	No. of visits and demonstrations.	No. of lectures delivered.	Total attendance at lectures.	No. of demonstration plots laid down	No. of vegetable plots laid own.
Antrim ..	2	1,812	32	840	40	19
Armagh ..	2	1,296	22	901	14	32
Down ..	2	1,547	17	371	16	39
Fermanagh	1	921	12	120	4	10
Londonderry	1	929	17	338	41	6
Tyrone ..	1	1,039	23	240	14	48
Totals ..	9	7,544	123	2,810	129	154

Table showing the nature of the experiments carried out by the Instructors in Horticulture during 1930–31 :—

County.	Apple Scab.	Manuring Apple Trees.	Manuring Black Currants.	Apple thinning.	Black Currant Mite.	Control of Cabbage Root Fly Maggot.
Antrim ..	5	1	4	1	2	–
Armagh ..	3	–	4	1	2	–
Down ..	2	2	2	2	3	1
Fermanagh ..	–	–	–	1	1	–
Londonderry ..	2	–	1	1	1	–
Tyrone ..	2	–	–	1	–	–
Totals ..	14	3	11	7	9	1

Table showing the number of holdings entered for the "Prizes for Cottages Competition in Rural Districts," together with the number and total value of the prizes awarded :—

County.	No. of entries.			No. of prizes awarded in each class.			Total amount expended in prizes.
	Class I Cottages.	Class II Ex-service men.	Class III Championship.	Class I	Class II	Class III	
							£
Antrim ..	100	20	12	36	12	4	70
Fermanagh ..	19	5	6	8	4	4	39

Table giving particulars of the grants made by each County Committee for the purpose of assisting the promotion of Agricultural Shows, Ploughing Matches, etc., during 1930–31 :—

County.	Amount allocated.	Number and value of grants estimated to be paid in respect of :—			
		Agricultural Shows.		Skilled labour competitions (ploughing matches, etc.)	
		No.	Value.	No.	Value.
	£ s. d.		£ s. d.		£ s. d.
Antrim	420 0 0	11	410 0 0	2	10 0 0
Armagh	175 0 0	3	141 13 11	5	25 0 0
Down	527 0 0	11	245 7 6	3	20 0 0
Fermanagh ..	81 0 0	3	70 0 0	2	10 13 0
Londonderry ..	110 0 0	5	90 0 0	3	19 0 0
Tyrone ..	255 0 0	5	245 0 0	2	10 0 0
Totals ..	1,568 0 0	38	1,202 1 5	17	94 13 0

Table showing the amounts allocated and expended by the several county committees, together with the distribution of premiums for Stallions in the various counties :—

County.	Amount allocated.	Amount expended.	Number of premiums paid by county committee in respect of :—			
			Thoroughbred stallions.	Clydesdale stallions.	Irish Draught and Half-bred stallions.	Total.
	£	£				
Antrim ..	395	395	3	6*	1	10
Armagh ..	230	224½	2	3	–	5
Down ..	600	500	5	4	1	10
Fermanagh ..	185	185	1	2	1	4
Londonderry	260	260	2	4*	–	6
Tyrone ..	320	320	2	5	1	8
Totals ..	1,990	1,884½	15	24	4	43

* Two partial premiums both in County Antrim and County Londonderry.

Table showing the values of premiums for stallions adopted by each county committee in 1931 :—

County.	Thoroughbred.	Clydesdale.	Irish Draught and Half-bred.
	£	£	£
Antrim ..	50	35	35
Armagh ..	55	40	—
Down ..	60	40	40
Fermanagh ..	60	40	45
Londonderry ..	50	40	—
Tyrone ..	55	35	35

Table showing the number of mares served by each class of stallion in 1931 :—

County.	Mares served by Thoroughbred stallions.	Mares served by Clydesdale stallions.	Mares served by Irish Draught and Half-bred stallions.
Antrim	170	472	90
Armagh	60	143	—
Down	226	251	94
Fermanagh ..	37	120	50
Londonderry ..	93	355	—
Tyrone	66	325	32
Totals	652	1,666	266

Table showing the number of licensed stallions in each year from 1923 :—

County.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Antrim ..	44	33	29	35	37	37	38	46	40
Armagh ..	6	8	7	10	11	15	15	18	19
Down ..	42	38	35	35	34	41	42	44	41
Fermanagh ..	10	9	9	11	13	14	15	18	18
Londonderry ..	35	34	27	28	24	26	29	30	33
Tyrone ..	16	19	15	13	13	13	16	21	16
Totals ..	153	141	122	132	132	146	155	177	167

Table showing the regulations made by the several county committees in regard to service fees for cows, etc. :—

County.	Service fees per cow.	Services.		Valuation of holding of cow owners.
		Yearling bulls	Older bulls	
		Minimum No.	Minimum No.	
Antrim ..	2/6 in all cases	30	40	Not limited.
Armagh ..	2/6 to 5/–	30	40	do.
Down ..	2/6 up to £50 valuation, 5/– over £50 valuation	30	40	do.
Fermanagh ..	2/6 in all cases	30	40	do.
Londonderry	2/6 up to £30 valuation, 4/– exceeding £30 valuation, and in all cases of continuation premiums	30	40	—
Tyrone ..	2/6 in all cases	30	40	Not limited.

Table showing the amounts allocated by county committees for premiums to bulls in 1931 and the estimated expenditure in each county :—

County.	Amount allocated.				Estimated expenditure.	Total No. of bulls standing for ordinary premiums in county.
	From joint fund.	Dairy bulls for M.R.A.'s (joint fund)	From agricultural development fund.	Total.		
	£	£	£	£	£	
Antrim ..	1,200	140	480	1,820	1,590	102
Armagh ..	540	60	240	840	778	48
Down ..	1,200	120	496	1,816	1,745	109
Fermanagh	480	80	480	1,040	† 1,062	65
Londonderry	554	60	348	962	939	56
Tyrone ..	950	100	352	1,402	1,337	81
Totals ..	4,924	560	2,396	7,880	* 7,451	461

* Excess expenditure over allocation will be met from savings effected in other live stock sections. In addition, an estimated expenditure of £413 will be incurred in paying premiums for 78 third-yea " special term " bulls, as in these cases instalments from the breeders will not be forthcoming to balance amount of premiums.

Table giving particulars of the bulls selected for and awarded ordinary premiums under the Cattle-breeding Scheme in 1931 :—

County.	Pure-bred registered dairy Shorthorn.		Pure-bred Shorthorn.	Registered dairy non-pedigree Shorthorn.	Aberdeen Angus.	Galloway.	Totals.
	Dam and sire registered.	Dam only registered.					
Antrim ..	20	12	31	9	7	23	102
Armagh ..	12	2	30	3	1	—	48
Down ..	22	5	42	5	35	—	109
Fermanagh ..	17	4	14	3	27	—	65
Londonderry	19	5	24	3	5	—	56
Tyrone ..	22	8	27	2	22	—	81
Totals ..	112	36	168	25	97	23	461

Table giving particulars of the distribution of " Special Term " bulls in 1931 :—

County.	Registered dairy Shorthorn.	Shorthorn.	Non-pedigree dairy Shorthorn.	Aberdeen Angus.	Galloway (for Glens district in Co. Antrim.)	Totals.
Antrim ..	3	–	3	–	2	8
Armagh ..	–	3	4	–	–	7
Down ..	–	4	–	2	–	6
Fermanagh	–	–	2	4	–	6
Londonderry	1	–	2	3	–	6
Tyrone ..	–	1	3	6	–	10
Totals ..	4	8	14	15	2	43

Table showing the number of bulls standing for service in Northern Ireland in 1931 under the Cattle-breeding Schemes :—

Ordinary premium bulls	461
" Special Term " bulls	205
Subsidised bulls	12
Total	678

Table showing the minimum qualifying standards for registration of dairy cows—ordinary and advanced :—

Breed.	Ordinary Register.			Advanced Register.		
	Milk (lb.)	Butter-fat (lb.)	Percentage of Butter-fat	Milk (lb.)	Butter-fat (lb.)	Percentage of Butter-fat
Shorthorn ..	6,000	210	3	8,000	280	3
British Friesian	8,000	280	3	10,000	350	3
Kerry ..	5,000	175	3	7,000	245	3
Jersey ..	5,000	225	4	7,000	315	4
Any other pure breed or non-pedigree	Same as for Shorthorn.			Same as for Shorthorn.		

Table illustrating the minimum registration yields required in the case of cows which failed to produce a calf within the 14 months' period, but calved within 16 months from the previous date of calving, and the deductions which are made when entering particulars in the Register :—

Breed.	Minimum yield to qualify for registration.		Deductions to be made from actual yield for entry in the Register where a calf has not been produced in 14 months but has within 16 months.	
	Milk (lb.)	Butter-fat (lb.)	Milk (lb.)	Butter-fat (lb.)
Shorthorn ..	10,000	350	2,000	Corresponding reduction based on the original calculated average percentage of butter-fat.
British Friesian ..	12,500	437.5	2,500	
Kerry ..	8,750	306.25	1,750	
Jersey ..	8,750	393.75	1,750	
Any other pure breed or non-pedigree	Same as for Shorthorn.			

Table showing yields of pure-bred and non-pedigree cows registered by the Ministry from the 1st October, 1930, to the 30th September, 1931 :—

Breed.	Number of cows registered on a yield of :—				Total No. of cows registered.
	Gallons 500-600	Gallons 600-800	Gallons 800-1000	Gallons Over 1000	
Pure-bred Shorthorn	—	60	28	3	91
British Friesian ..	—	—	—	1	1
Ayrshire ..	—	2	3	—	5
Kerry ..	8	9	1	1	19
Jersey ..	1	3	—	—	4
Non-pedigree Shorthorn	—	698	377	154	1,229
Totals ..	9	772	409	159	1,349

Table showing the yields of pure-bred and non-pedigree cows registered by the Ministry during the period 1st January, 1922, to 30th September, 1931 :—

Breed.	Number of cows registered on a yield of :—				Total No. of cows registered.
	Gallons 500-600	Gallons 600-800	Gallons 800-1000	Gallons Over 1000	
Pure-bred Shorthorn ..	—	524	182	35	741
British Friesian ..	—	6	25	26	57
Ayrshire ..	—	17	10	2	29
Kerry ..	46	27	3	2	78
Jersey ..	11	19	14	—	44
Red Poll ..	—	1	2	—	3
Non-pedigree Shorthorn	—	5,477	2,468	827	8,772
Totals ..	57	6,071	2,704	892	9,724

Table showing the number of Milk Recording Associations in Northern Ireland from 1921 to 1931 :—

County.	Number of Milk Recording Associations.										
	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Antrim ..	1	4	4	11	13	14	14	17	18	19	20
Armagh ..	1	1	1	4	4	5	6	6	7	7	7
Down ..	–	–	3	2	5	10	12	13	14	15	15
Fermanagh ..	1	4	3	6	6	6	9	10	10	9	9
Londonderry ..	–	–	1	4	4	7	7	7	8	8	8
Tyrone ..	3	4	5	7	10	11	12	13	13	14	15
Totals ..	6	13	17	34	42	53	60	66	70	72	74

Table showing the number of members of Milk Recording Associations in Northern Ireland from 1921 to 1931 :—

County.	Number of Members.										
	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Antrim ..	43	156	168	394	488	447	540	634	596	647	690
Armagh ..	14	47	133	167	173	189	274	268	340	339	325
Down ..	—	—	115	68	186	425	502	531	594	605	567
Fermanagh ..	15	117	94	169	198	211	345	360	371	384	388
Londonderry ..	—	—	58	168	132	305	302	292	326	359	326
Tyrone ..	127	121	176	198	346	391	445	429	451	498	580
Totals ..	199	441	744	1,164	1,523	1,968	2,408	2,514	2,678	2,832	2,876

Table showing the number of cows entered in Milk Recording Associations in Northern Ireland from 1921 to 1931 :—

County.	Number of Cows entered in Associations.										
	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Antrim	245	1,052	1,074	2,458	2,733	3,100	3,168	3,520	3,403	3,681	4,035
Armagh	112	192	506	747	680	859	1,016	1,008	1,156	1,316	1,506
Down	—	—	544	440	971	1,833	2,266	2,316	2,684	2,994	3,213
Fermanagh	133	931	698	1,119	1,044	1,034	1,668	1,805	1,881	1,906	2,024
Londonderry	—	—	306	922	824	1,793	1,750	1,638	1,849	2,039	1,935
Tyrone	754	934	1,210	1,417	1,861	2,264	2,297	2,320	2,426	2,634	2,892
Totals	1,244	3,109	4,338	7,103	8,113	10,833	12,165	12,607	13,399	14,570	15,605

Table showing the number and value of premiums awarded for boars in each of the six counties by the several county committees in 1931 :—

County.	1st year boars.		2nd year boars.		Breeds.		Total No. of boars awarded premiums.
	Value of premiums.	No. of boars.	Value of premiums.	No. of boars.	Large White Ulster.	Large White York.	
	£		£				
Antrim ..	9	21	9	15	28	8	36
Armagh ..	9	11	9	13	21	3	24
Down ..	9	13	8	19	19	13	32
Fermanagh ..	9	16	9	10	17	9	26
Londonderry	10	10	8	12	18	4	22
Tyrone ..	8	21	6	21	31	11	42
Totals ..	—	92	—	90	134	48	182

Table showing the amounts allocated for premiums to boars and the estimated expenditure in each county :—

County.	Amount allocated.			Estimated expenditure.	Total number of boars standing during service season.
	From joint fund.	From agricultural development fund.	Total.		
	£	£	£	£	
Antrim ..	250	72	322	324*	36
Armagh ..	140	81	221	216	24
Down ..	200	98	298	269	32
Fermanagh ..	153	81	234	234	26
Londonderry ..	140	72	212	196	22
Tyrone ..	225	112	337	294	42
Totals ..	1,108	516	1,624	1,533	182

* Excess expenditure over allocation will be met from savings on other live stock schemes.

Table showing the operations of the Sheep-breeding Scheme in mountainous districts :—

County.	Amount allocated.		Total No. of rams placed out.	Nett expenditure (cost of rams less receipts from sales).	Excess over ordinary allocation borne from agricultural development fund.
	From joint fund.	From agricultural development fund.			
	£	£		£ s. d.	£ s. d.
Antrim ..	100	352	67	272 4 6	172 4 6
Armagh ..	30	58	2	7 8 6	– – –
Down ..	80	282	21	91 19 7	11 19 7
Londonderry ..	60	282	28	112 13 3	52 13 3
Tyrone ..	60	282	35	119 10 5	59 10 5
Totals ..	330	1,256	153	603 16 3	296 7 9

NOTE—County Fermanagh did not participate.

Table illustrating the operations of the Sheep-breeding Scheme in lowland districts :—

County.	Allocation from joint fund.	Number of premium rams.		
		Border Leicester.	Suffolk.	Total.
	£			
Antrim ..	48	6	–	6
Armagh ..	40	7	–	7
Down ..	120	12	2	14
Fermanagh ..	32	4	–	4
Londonderry ..	104	12	1	13
Tyrone ..	72	8	1	9
Totals ..	416	49	4	53

GRANTS TO ASSOCIATIONS.

Apart from grants made to Agricultural Show Societies through county committees, special contributions were made by the Ministry directly to the funds of the undermentioned Societies as follows :—

	£
Ulster Farmers' Union (Educational Committee)	1,000
Ulster Agricultural Organisation Society, Ltd.	700
Royal Ulster Agricultural Society	460
North-West of Ireland Agricultural Society	120
Ulster Horticultural Society	75
Ulster Goat Society	50
Ulster Ram Breeders' Association	50
Northern Ireland Rabbit Society	20
Imperial Fruit Show	18
Ulster Grade A. T.T. Milk Producers' Association	25
World's Poultry Science Association	5

OFFICIALS OF COUNTY COMMITTEES OF AGRICULTURE.

ANTRIM :

Chairman :	Lieut.-Col. J. Patrick, D.L., Dunminning, Glarryford.
Vice-Chairman :	Charles B. Smith, Cragoran, Larne Harbour.
Secretary :	A. B. Clarke, B.A., County Courthouse, Belfast.
Instructors :	P. T. O'Hare, A.R.C.Sc.I. (Agriculture.)
	R. D. Mackay, N.D.A., N.D.D. (Hons.) (Agriculture).
	R. H. Clarke (Horticulture and Bee-keeping).
	W. R. Saunderson (Horticulture and Bee-keeping).
	Miss A. M. Nedwill (Poultry-keeping and Butter-making).
	Miss A. Mahony (Poultry-keeping and Butter-making).
	P. McHugh (Agricultural Overseer).
	J. Boyd (Agricultural Overseer).

ARMAGH :

Chairman :	J. J. W. Dunlop, Rosemount, Annaghmore.
Vice-Chairman :	R. R. Murphy, J.P., Lislea, Keady.
Agricultural Organiser :	J. Algie, B.Sc., 4, College Street, Armagh.
Instructors :	S. Jordan, B.Agr. (Agriculture).
	J. Hagan (Horticulture and Bee-keeping).
	J. Scrimgeour (Horticulture and Bee-keeping).
	Miss A. G. English (Poultry-keeping and Butter-making).
	J. Graham (Agricultural Overseer).
	M. Turley (Agricultural Overseer).

DOWN :

Chairman :	James Ireland, J.P., Ivyholme, Lessans, Saintfield.
Vice-Chairman :	George Wallace, J.P., Lakeview, Corbet, Banbridge.
Agricultural Organiser :	J. L. McWhinney, A.R.C.Sc.I., N.D.A., Northern Bank Chambers, May Street, Belfast.
Instructors :	R. W. Dickson, A.R.C.Sc.I. (Agriculture).
	R. F. Small, B.Agr. (Agriculture).
	A. E. Johnston, A.R.C.Sc.I. (Horticulture and Bee-keeping).
	D. W. Baillie (Horticulture and Bee-keeping).
	Miss W. McMullen (Poultry-keeping and Butter-making).
	Miss L. Walters (Poultry-keeping and Butter-making).
	J. G. Jamieson (Agricultural Overseer).
	V. Boyce (Agricultural Overseer).

FERMANAGH :

Chairman :	Rev. Canon John Hall, Garvary, Enniskillen.
Vice-Chairman :	Senator J. Porter-Porter, D.L., Belle Isle, Lisbellaw.
Secretary :	W. H. West, Courthouse, Enniskillen.
Instructors :	D. T. Ritchie (Agriculture).
	J. C. Johnston (Horticulture and Bee-keeping).
	Miss A. M. Callery (Poultry-keeping).
	T. C. Skelly (Agricultural Overseer).
	H. S. Flack (Agricultural Overseer).
	W. R. M. Boyd (Agricultural Overseer).

LONDONDERRY :

Chairman :	H. E. Thompson, M.B.E., J.P., Ballindrum House, Coagh, Moneymore.
Vice-Chairman :	W. McCollum, Drumcroon, Coleraine.
Secretary :	T. K. Caldwell, Courthouse, Coleraine.
Instructors :	D. R. Aiken, A.R.C.Sc.I. (Agriculture).
	A. McL. May (Horticulture and Bee-keeping).
	Miss L. Gray (Poultry-keeping and Butter-making).
	Miss E. E. Clarke (Poultry-keeping and Butter-making).
	A. J. McFarland (Agricultural Overseer).
	E. Graham (Agricultural Overseer).
	D. McMullan (Agricultural Overseer).

TYRONE :

Chairman :	John Johnston, Mountjoy East, Omagh.
Vice-Chairman :	Thomas Hegan, J.P., Desertcreat, Tullyhogue.
Secretary :	W. Walsh, Courthouse, Omagh.
Instructors :	E. S. Daly, A.R.C.Sc.I. (Agriculture).
	W. J. Patterson, A.R.C.Sc.I., N.D.A. (Agriculture).
	J. Jamieson, B.Sc. (Agriculture).
	D. McKenzie (Horticulture and Bee-keeping).
	Miss M. H. Davidson (Poultry-keeping).
	Miss M. A. C. Woods (Poultry-keeping).
	P. Dolan (Agricultural Overseer).
	J. M. Flanagan (Agricultural Overseer).
	J. McFerran (Agricultural Overseer).
	W. J. Martin (Agricultural Overseer).

GREENMOUNT

AGRICULTURAL AND HORTICULTURAL COLLEGE,

MUCKAMORE, CO. ANTRIM.

(Under the Management of the Antrim County Committee of Agriculture.)

Principal : R. J. FANNIN, A.R.C.Sc.I., N.D.A.

EDUCATIONAL EXHIBITS AT SHOWS.

As usual the principal educational exhibit of the Ministry was staged at the Royal Ulster Agricultural Society's Show held at Balmoral during the last week in May. The general lay-out of the display in the main hall was altered so as to group the exhibits into eight large sections, viz. :—

Crops and Feeding of Stock.
Poultry-keeping.
Horticulture.
Animal Diseases.
Agricultural Schools.
Marketing and Economics.
Forestry.
Publications and Ordnance Survey.

The Annexe or Livestock Hall was occupied by groups of animals, principally cattle and pigs, on which experiments had been conducted.

CROPS AND FEEDING OF STOCK.

This section included some of the work which had been done by the Plant Disease, Seed Testing, Plant Breeding and Animal Nutrition Research Divisions. The advantages of planting potatoes from stocks known to be free from virus diseases were shown by plots of growing specimens and by heaps of potatoes representing the

comparative yields from experiments carried out the previous season at 14 different centres. The results of spraying fruit trees and of dressing cereal seeds were also shown. The Seed Testing Division dealt with the importance of having agricultural seeds tested for purity and germination. It also emphasised the importance of developing the trade in rye-grass seeds, and of strain in the case of grasses and clovers. The results of oat variety experiments carried out in each of the six counties over a period of years were shown. In these tests some varieties raised by the Plant Breeding Division have given consistently good results and indicate that they are particularly suitable for certain areas in Northern Ireland. The object of this particular exhibit was to make these varieties more widely known. The Animal Nutrition Division contributed information on the purchase and most economic use of feeding stuffs. How the costs of rations may be lowered by using those foods which supply the necessary ingredients at the lowest cost per unit was illustrated. A comprehensive exhibit dealing with the seeding, manuring and management of pasture was staged.

POULTRY-KEEPING.

Poultry-keeping cannot be successful unless an abundant supply of winter eggs is obtained, and these will only be produced in sufficient numbers if at least 75 per cent. of the laying flock is made up of early-hatched, well-reared pullets. A comprehensive exhibit was staged, showing how pullets may be most successfully reared through all the stages——from the selection of the parent stock until the birds come into lay—at moderate cost and with the minimum of labour. Another exhibit showed the results from an experiment in which substitutes for separated milk as a source of protein were used, while still another showed a comparison of oyster shell and limestone grit as sources of calcium. Other important points in the general management were emphasised.

HORTICULTURE.

In this section special attention was given to producing apples which will increase the demand both at home and abroad. The various details of cultivation and the methods by which diseases and pests may be controlled were demonstrated. Other sections dealt with the cultivation of bush fruits, control of vegetable diseases, preservation of fruit and vegetables, bee-keeping and the marketing of honey.

ANIMAL DISEASES.

This section dealt principally with Bacillary White Diarrhoea and Coccidiosis of Chickens, Worms in Pigs and Fluke in Sheep, while attention was also given to the treatment of Felon, Sterility and Abortion of Cows and " Blows " in Pigs. Methods of treatment of disease-infested pasture were recommended.

AGRICULTURAL SCHOOLS.

The importance of agricultural education for both boys and girls who intend to live on farms is becoming every year more appreciated. The channels in Northern Ireland through which a young man receives his agricultural education are County Winter Agricultural Classes and Greenmount Agricultural and Horticultural College, while those in the case of a girl are County Poultry-keeping and Butter-making Classes, the North-West School and the Ulster Dairy School. The nature of the instruction given at classes and schools and full particulars regarding admission were indicated.

MARKETING AND ECONOMICS.

Eggs, poultry, potatoes, butter and fruit constitute a large proportion of the exports of Northern Ireland. The object of the Marketing Exhibit was to show producers and exporters the types of produce which are in demand and how they should be graded and packed so as to increase the demand and command remunerative prices. Correct methods of testing, grading, and packing of eggs and the most up-to-date appliances for such work were demonstrated. Another section dealt with the marketing of dead poultry. To encourage a greater home consumption of eggs and poultry a series of cookery demonstrations was given, the dishes cooked being composed largely of these products. Recipes for the making of these and several other dishes were freely distributed.

The requirements of the Marketing of Potatoes Act as regards grading, bagging and branding were indicated, while those interested in the marketing of dairy produce were afforded an opportunity of becoming acquainted with the provisions and requirements of the Marketing of Dairy Produce Act. As the Marketing of Fruit Act was about to come into operation visitors to the Show were given an opportunity of seeing grades, methods of packing, standard packages, etc., which would be approved for export.

Information regarding the economics and statistics of agriculture in Northern Ireland was displayed by means of charts and diagrams.

FORESTRY.

On almost all farms there is a certain amount of land which is of little or no use for agricultural purposes but could be profitably used for the growing of timber. The difficulty, however, with most farmers is that they have very limited knowledge of the suitability of the various species of trees for different conditions. The principal object of the Forestry Exhibit was to provide information on this subject. A rate-of-growth exhibit showed the development of home-grown trees in less than 20 years where species to suit particular conditions were used. Another exhibit showed the particular kinds of home-grown timber which are most suitable for the construction of the various articles used on the farm and in the home.

LIVE STOCK.

The policy of the Ministry being to develop the production of high class live stock, all the space in the Annexe was devoted to this branch of agriculture. The object of the live stock exhibits was to show farmers the particular types of product which are in greatest demand and the means by which they can be produced most economically. The exhibits included three lots of calves which had been reared on different rations, two lots of early-maturity beef cattle which had been fattened on different rations, four lots of pigs which had been fattened on different rations, and three lots of pigs of different breeds. Each exhibit represented a large number of tests previously carried out in the counties. Full summaries of the results obtained were displayed.

Another exhibit indicated the extent of damage—approximately one million pounds per annum—caused by the warble grub in cattle, and the methods by which this loss may be prevented. During the previous season experiments on the destruction of warbles had been carried out on 25 different farms in Northern Ireland, the treatment used proving 97 per cent. successful. Full particulars of this treatment were given and exceptional interest was shown by cattle owners. The Ministry acknowledges its indebtedness to the Hide and Allied Trades' Improvement Society for the loan of hides, etc., and to its Secretary, Mr. Lowden, for his personal attendance and very valuable assistance.

Farmers are becoming more aware of the importance of dehorning calves which are intended for export to Great Britain, and to afford them an opportunity of seeing how the operation should be performed dehorning demonstrations were given at intervals.

Another exhibit which attracted particular attention the previous year was repeated. This exhibit consisted of a sow and her litter of about 12 weeks old, together with particulars of the cost of rearing the young pigs to this stage. The comparatively low cost of rearing suckers was the source of considerable discussion and demonstrated to many pig feeders the advantage of rearing, instead of purchasing, the pigs which they fatten. The returns showed that, speaking generally, the rearer gets a bigger share of the profits than the person who fattens. This point is significant because of the fact that a big proportion of the pigs fattened in Northern Ireland is imported.

The method of estimating by the eye the value of store and fat cattle is, to say the least, haphazard. To demonstrate this fact a competition in which the public was invited to judge the weight and value of four stores and two fat cattle was held on each day of the Show. The interest taken in this exhibit greatly exceeded expectations.

Demonstrations on the production of Grade A (tuberculin tested) milk were given daily.

PUBLICATIONS AND ORDNANCE SURVEY.

Free copies of all the Ministry's leaflets and circulars were available while its other publications were sold at nominal charges. The Ordnance Survey provided specimens of maps which are issued for Northern Ireland. A map showing the acreage in each field is of considerable use to a progressive farmer.

GENERAL.

The Ministry's officials were assisted at Balmoral by the Instructors of the County Committees of Agriculture. At the more important County Shows held during the season the County officials staged educational exhibits on lines somewhat similar to those at Balmoral but on a less elaborate scale. At these County Shows the Ministry assisted by lending materials and giving the services of members of its technical staff where required. An exhibit dealing entirely with horticultural subjects was staged at the Ulster Horticultural Society's Fruit Show held in the Ulster Hall, Belfast, in November, 1930.

APPENDIX IV.

FINANCE.

	Page.
Agricultural Loans and Allied Schemes	97
Account of Parliamentary Grants in the year ended 31st March, 1931 ..	100
Summary of Loan Accounts on 31st March, 1931	103
Amounts contributed from Local Rates and by the Government for the purposes of Agricultural Schemes under the Local Statutory Committees during the year ended 31st March, 1931	104
Expenditure on Agricultural Schemes by County Committees of Agriculture during the year ended 31st March, 1931	105
Expenditure of Local Authorities (County Councils) under the Diseases of Animals Acts and the Orders thereunder, and the amounts recouped to Local Authorities from the General Cattle Diseases (Northern Ireland) Fund during the year ended 31st March, 1931	106
General Cattle Diseases (Northern Ireland) Fund for the year ended 31st March, 1931	107

AGRICULTURAL LOANS AND ALLIED SCHEMES.

The objects of the various loan schemes have been fully described in previous Reports.

Guaranteed Loans.

Under this heading are included loans issued by the Banks to farmers under Government guarantee of principal and interest. The loans fall into two classes, viz., those devoted to purchase of live stock and those applied to purchase of seeds and artificial fertilisers. The schemes in operation in 1930 were continued in 1931 without alteration, save for a reduction from 5 per cent. to 4½ per cent. in the rate of discount chargeable by the Banks. The terms and conditions applicable to the loans were explained in the Ministry's Eighth and Ninth Annual Reports. Particulars of the Ministry's commitments in this connection are shown in the following table :—

Nature of Loan.	Loans guaranteed prior to 1931.		Loans guaranteed 1st January, 1931, to 30th November, 1931.		Total amount guaranteed to 30th November, 1931.		Total repayments by borrowers to 30th Nov., 1931.	Guarantees outstanding at 30th November, 1931.	
	No.	Amount.	No.	Amount.	No.	Amount.		No.	Amount.
		£		£		£	£		£
Replacement of live stock, 1925–28	1,649	77,928	—	—	1,649	77,928	60,078	1,515	17,850
Purchase of live stock, 1930–31	426	18,697	126	4,959	552	23,656	105	551	23,551
Purchase of seeds and artificial fertilisers, 1929–31	143	2,418	16	284	159	2,702	2,075	50	627
Totals	2,218	99,043	142	5,243	2,360	104,286	62,258	2,116	42,028

The territorial distribution of the loans guaranteed since 1929 is as follows :—

County	Loans granted.	
	No.	Amount.
		£
Antrim	17	1,785
Armagh	96	2,925
Down	116	3,988
Fermanagh	298	10,702
Londonderry	31	1,858
Tyrone	153	5,100
Totals	711	26,358

Since the inauguration of the first scheme in 1925 the amount falling to be redeemed under Government guarantee and written-off as irrecoverable amounts to a total of £406, representing the balances of nine separate loans and being less than one-half per cent. of the total sum of £104,286 which the guarantees have covered.

SCHEME FOR THE IMPROVEMENT OF AGRICULTURAL HOLDINGS BY DRAINAGE AND OTHER WORKS, AND FOR EXTENDING EMPLOYMENT IN RURAL AREAS.

This scheme which was described in the Ministry's Eighth and Ninth Annual Reports continued to operate during the period under review. Statistics of grants paid up to the 31st March, 1931, are as follows :—

County.	Grants paid up to 31st March, 1930.		Grants paid in year ended 31st March, 1931.		Total to 31st March, 1931.	
	No.	Amount.	No.	Amount.	No.	Amount.
		£		£		£
Antrim	18	517	53	1,252	71	1,769
Armagh	6	79	11	274	17	354
Down	10	721	27	620	37	1,341
Fermanagh	1	25	18	871	19	895
Londonderry ..	5	202	26	961	31	1,163
Tyrone	9	567	14	525	23	1,092
Totals	49	2,111	149	4,503	198	6,614

Three loans to supplement grants approved under the scheme were issued during the year, making a total of ten loans for that purpose issued to date.

The number of acres of land improved with the aid of grants given by the Ministry is estimated at 7,614 for the period from the inception of the scheme in 1929 up to 31st March, 1931. Farm roads to the estimated number of 33 in various parts of the country have also been constructed or improved mainly if not entirely by reason of the financial assistance afforded by the Ministry. A certificate as to satisfactory completion of work has been required in every case before the issue of any grant, and in the very few cases in which the work done was not up to standard, or where the conditions in regard to recruitment of labour from the Employment Exchanges were not faithfully observed, the grants otherwise payable were reduced or withheld.

ACCOUNT OF PARLIAMENTARY GRANTS IN THE YEAR ENDED 31st MARCH, 1931.

Vote No. 2. Class VI. Agricultural Services.

Moneys voted by Parliament to defray the expenses of the Ministry of Agriculture in respect of Agricultural Education and Research, Improvement of Live Stock, Agricultural Development, Afforestation and Diseases of Animals, including Sundry Grants-in-Aid (16 Geo. V. c. 4 (N.I.)).

RECEIPTS.	£	s.	d.
Parliamentary Grant ..	120,808	0	0
Receipts Appropriated-in-Aid :—			
Fees for testing seeds ..	445	0	3
Plant Breeding Division (sale of seed, &c.) ..	172	13	11
Animal Diseases Division (sale of vaccine, &c.)	198	3	3
Poultry Division (sale of eggs, &c.)	954	7	5
Fees for inspection of cows	96	2	0
Live Stock Breeding Acts (fees for licences, &c.)	1,274	16	6
Live Stock Replacement Loans : Recoveries from defaulting borrowers ..	410	2	1
Fees for licences under the Marketing of Eggs Act (N.I.), 1924	136	12	6
Fees for licences under the Marketing of Potatoes Act (N.I.), 1928 ..	27	0	0
Fees for Inspection of Potatoes	2,040	9	3
Sales of potatoes and flax from Experimental plots	130	13	8
Forestry (sale of timber, &c.)	2,392	10	0
Recovery from the Empire Marketing Fund in respect of cost of special Inquiries conducted by the Ministry	964	4	9
Fees for registration of premises under the Marketing of Dairy Produce Act (N.I.), 1929 ..	115	0	0
Miscellaneous	65	15	11
	£130,231	11	6

PAYMENTS.	£	s.	d.
Agricultural Research and Faculty of Agriculture	18,055	0	5
Agricultural Education £13,683 2 3 Less Receipts* 4,971 14 9	8,711	7	6
Improvement of Live Stock	9,621	15	9
Live Stock Breeding Acts	235	2	2
Animal Quarantine Station	406	18	8
Diseases of Animals (Grant-in-Aid)	5,767	2	0
Replacement of Live Stock	1,022	5	3
Poultry Industry ..	1,388	16	3
Marketing of Eggs ..	2,433	17	2
Dairying Industry ..	205	7	0
Grants to Co. Committees	28,904	4	7
Grants to Agricultural Societies, &c.	2,797	18	5
Flax and Potato Industries	9,822	4	8
Grants for Improvement of Agricultural Holdings (Unemployment Relief)	5,276	15	5
Emergency Grants in respect of damage due to flooding (Unemployment Relief)	891	0	0
Forestry	12,505	5	10
Forestry (Unemployment Relief Scheme) ..	2,382	13	3
Forestry (Purchase of new areas)	593	13	6
Empire Marketing Schemes	1,444	18	8
Miscellaneous	239	14	2
Balance on 31st March, 1931 (to be surrendered)	17,525	10	10
	£130,231	11	6

*£4,971 : 14 : 9 pupils' fees and sales of produce at the Agricultural Schools.

ACCOUNT OF PARLIAMENTARY GRANTS IN THE YEAR ENDED 31st MARCH, 1931.

Vote No. 3. Class VI. Surveys.

Moneys voted by Parliament to defray the expenses of the Ministry of Agriculture in respect of Ordnance and Geological Surveys.

RECEIPTS.	£	s.	d.
Parliamentary Grant ..	8,589	0	0
Receipts Appropriated-in-Aid (Sale of Maps, &c.)	1,476	12	1
	£10,065	12	1

PAYMENTS.	£	s.	d.
Salaries, Wages and Allowances	8,174	4	3
Travelling, Subsistence and Removal Expenses	80	12	10
Rent, Rates and Insurance	300	10	0
Fuel, Light, Water, Cleaning Articles, &c. ..	79	7	5
Maintenance, Renewals and Repairs	61	9	11
Incidental Expenses ..	64	10	2
Postages, Telegrams and Telephones	26	13	9
Materials for Map Production	117	2	7
Map Production: Agency Charges (Supplementary)	703	2	11
Geological Survey ..	2	1	5
Balance on 31st March, 1931 (to be surrendered)	455	16	10
	£10,065	12	1

ACCOUNT OF PARLIAMENTARY GRANTS IN THE YEAR ENDED 31st MARCH, 1931.

Vote No. 1. Class VI. Ministry of Agriculture.

Moneys voted by Parliament to defray the Salaries and Expenses of the Ministry of Agriculture.

RECEIPTS.	£	s.	d.
Parliamentary Grant ..	75,756	0	0
Receipts Appropriated-in-Aid (Recoveries of Law costs, &c.)	205	14	8
	£75,961	14	8

PAYMENTS.	£	s.	d.
Salaries, Wages and Allowances	56,330	1	3
Travelling, Subsistence and Removal Expenses ..	5,651	7	8
Collection of Agricultural Statistics	3,235	1	7
Rent, Rates and Insurance	1,117	0	3
Fuel, Light, Water, Cleaning Articles, &c. ..	362	8	7
Maintenance, Renewals and Repairs	201	19	5
Printing	1,692	17	0
Stationery, Books and Office Supplies	535	5	3
Stationery Office Publications (N.I.)	278	9	6
Law Charges	133	16	0
Postages, Telegrams and Telephones	3,024	0	6
Incidental Expenses ..	714	9	2
Balance to 31st March, 1931 (to be surrendered) ..	2,684	18	6
	£75,961	14	8

SUMMARY OF LOAN ACCOUNTS ON 31st MARCH, 1931.

(Loans advanced from Government Loans Fund through Ministry of Agriculture.)

Nature of Loan.	Loans outstanding on 31st March, 1930.		Loans advanced in 1930/31.		Principal repaid in 1930/31.	Interest repaid in 1930/31.	Loans outstanding on 31/3/31.	
	No.	Amount.	No.	Amount.			No.	Amount.
		£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.
Purchase of Stallions	25	1,161 6 9	4	312 13 4	407 17 4	55 4 9	22	1,066 2 9
„ Bulls	46	1,270 14 11	7	619 16 0	638 12 8	43 14 0	26	1,251 18 3
„ Agricultural Machinery	6	263 0 0	–	– – –	180 15 0	13 19 4	3	82 5 0
Erection of Fencing	12	760 12 11	8	545 0 0	76 13 2	47 2 8	20	1,228 19 9
Improvement of Agricultural Holdings ..	7	328 0 0	3	150 0 0	75 12 0	19 0 8	10	402 8 0
Losses of Crops and Live Stock due to Flooding	56	3,313 0 0	–	– – –	– – –	– – –	56	3,313 0 0
Totals	152	7,096 14 7	22	1,627 9 4	1,379 10 2	179 1 5	137	7,344 13 9

TABLE SHOWING BY COUNTIES THE AMOUNTS CONTRIBUTED FROM LOCAL RATES, AND THE AMOUNTS CONTRIBUTED BY THE GOVERNMENT FOR THE PURPOSES OF AGRICULTURAL SCHEMES UNDER LOCAL STATUTORY COMMITTEES DURING THE YEAR ENDED 31st MARCH, 1931.

County.	Rate in the £.	Total Produce of and Contribution from Local Rates.	Contributions from the Ministry.			Additional Contributions by the Ministry of Finance from the Agricultural Development Fund.	Total Contributions from Government Funds.
			General Grant.	Grants for Special Schemes.	Agricultural Classes Grant.		
	d	£	£	£ s. d.	£ s. d.	£	£ s. d.
Antrim	1	2,553	5,680 (a)	984 4 5	108 3 9	1,303	8,075 8 2
Armagh	1	1,440	2,832	668 14 9	30 14 0	740	4,271 8 9
Down	1	2,830	4,846	747 0 8	170 14 5	1,423	7,186 15 1
Fermanagh	1	950	2,663	853 2 3	22 8 3	1,232	4,770 10 6
Londonderry	1	1,211	3,048	982 11 0	94 3 0	1,149	5,273 14 0
Tyrone	1	1,723	4,343	1,753 14 9	141 13 4	1,419	7,657 8 1
Totals	–	10,707	23,412	5,989 7 10	567 16 9	7,266	37,235 4 7

(a) This includes a Grant-in-Aid of £1,000 in respect of Greenmount Agricultural College and a sum of £65 on foot of Scholarships in Horticulture awarded by the Ministry and tenable at the College.

TABLE SHOWING EXENDITURE ON AGRICULTURAL SCHEMES BY COUNTY COMMITTEES OF AGRICULTURE DURING THE YEAR ENDED 31st MARCH, 1931.

County.	Itinerant Instruction in Agriculture.	Winter Agricultural Classes.	Horticulture and Bee-Keeping.	Poultry-Keeping and Butter-Making.	Live Stock.	Subsidies to Shows.	Grants to Milk Recording Associations.	Agricultural Overseers.	Improvement of Pastures.	Cottage and Farm Prizes.	General Administration.	Scholarships.	Totals.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d. (a)	£ s. d.
Antrim ..	1,207 4 8	92 0 11	1,042 10 4	1,625 15 6	3,395 5 11	484 13 0	190 0 0	643 2 8	154 19 5	92 15 4	999 12 7	1,124 2 9	11,052 3 1
Armagh	634 16 1	32 8 1	1,024 6 4	826 3 1	1,640 16 8	180 16 7	65 0 0	583 9 4	85 5 5	—	788 11 1	290 2 6	6,151 15 2
Down ..	1,110 10 2	112 18 1	914 9 9	1,621 11 6	3,965 4 7	503 3 5	145 0 0	719 15 5	27 5 3	—	768 19 3	1,035 7 6	10,924 4 11
Fermanagh ..	741 15 4	24 5 8	350 17 8	831 5 6	2,150 4 4	88 4 0	90 0 0	943 13 1	—	53 4 0	616 6 8	219 12 6	6,109 8 9
Londonderry	674 6 8	28 18 3	455 9 [illegible]	1,219 17 9	2,012 0 4	170 4 6	80 0 0	853 8 3	113 3 3	—	806 2 11	437 2 6	6,850 14 2
Tyrone	1,692 14 11	107 10 5	348 12 0	1,497 4 7	2,565 3 11	276 19 3	140 0 0	1,161 15 1	200 19 7	—	929 6 11	432 7 6	9,352 14 2
	6,061 7 10	398 1 5	4,136 5 10	7,621 17 11	15,728 15 9	1,704 0 9	710 0 0	4,905 3 10	581 12 11	145 19 4	4,908 19 5	3,538 15 3	50,441 0 3

(a) Includes £323 7s. 9d. up-keep of Greenmount Agricultural College

EXPENDITURE OF LOCAL AUTHORITIES (COUNTY COUNCILS) UNDER THE DISEASES OF ANIMALS ACTS AND THE ORDERS THEREUNDER, AND THE AMOUNTS RECOUPED TO LOCAL AUTHORITIES FROM THE GENERAL CATTLE DISEASES (N.I.) FUND DURING THE YEAR ENDED 31st MARCH, 1931.

Districts of Local Authorities.	Expenditure of Local Authorities.		Receipts from the dipping of Sheep.	Total Net Expenditure.	Amounts repaid to Local Authorities during the year ended 31st March, 1931, from the General Cattle Diseases (Northern Ireland) Fund.
	Salaries and Allowances.	Other Expenses.			
	£ s. d	£ s. d.	£ s. d.	£ s. d.	£ s. d.
County Antrim	1,060 4 7	1,306 8 2	– – –	2,366 12 9	1,864 18 9
„ Armagh	734 17 1	754 2 11	– – –	1,489 0 0	1,194 17 6
„ Down	1,431 18 11	2,073 11 11	– – –	3,505 10 10	2,536 0 9
„ Fermanagh	483 2 8	603 18 0	105 13 2	981 7 6	525 11 0
„ Londonderry	804 2 7	881 14 10	146 13 5	1,539 4 0	1,085 16 9
„ Tyrone	1,562 2 1	1,755 1 7	480 10 8	2,836 13 0	1,999 11 6
„ Borough of Belfast ..	350 0 0	65 5 0	– – –	415 5 0	294 7 6
„ „ Londonderry	124 7 3	– – –	– – –	124 7 3	55 0 4
Totals	6,550 15 2	7,440 2 5	732 17 3	13,258 0 4	9,556 4 1

GENERAL CATTLE DISEASES FUND FOR NORTHERN IRELAND.
(16 Geo. V. C. 4.)

Accounts of Receipts and Payments in respect of the General and Special Accounts of the above Fund for the year ended 31st March, 1931.

GENERAL ACCOUNT.

RECEIPTS.	£	s.	d.
Balance on 1st April, 1930	1,486	12	9
Assessment on Local Authorities	5,050	1	2
Parliamentary Grant (Class VI. No. 2 Subhead C. 4)	4,552	3	10
Proportion of Fines in Prosecutions under Diseases of Animals Acts	178	9	7
Bank Interest	56	13	3
	£11,324	0	7

PAYMENTS.	£	s.	d.
Recoupment to Local Authorities in respect of Compensation and Expenses under the Diseases of Animals Acts	9,556	4	1
Miscellaneous Expenses	12	8	8
Balance on 31st March, 1931	1,755	7	10
	£11,324	0	7

SPECIAL ACCOUNT.

RECEIPTS.	£	s.	d.
Parliamentary Grant (Class VI. No. 2. Subhead C. 4)	1,214	18	2
	£1,214	18	2

PAYMENTS.	£	s.	d.
Salaries of Staff	133	5	9
Travelling Expenses	304	0	11
Miscellaneous expenses, including cost of requisites for cleansing and disinfection and casual labour in killing, burying, branding and removal of animals, and other petty expenses :— Swine Fever	62	5	0
Compensation to owners of animals slaughtered in connection with Swine Fever	715	6	6
	£1,214	18	2

APPENDIX V.

FORESTRY.

During the year three areas comprising 390 acres were acquired for forestry purposes, making the total area available 15,209 acres. The following are particulars of the lands purchased during the year :—

Approximate Area. Acres.	*Situation of Land.*
115	Leck, County Londonderry.
70	Ballycastle, County Antrim.
205	Fathom Wood, County Armagh.
Total 390	

An offer was made by the Ministry to purchase a small area of about 50 acres, situated at Drumramer, County Londonderry, but it was refused by the owner of the property.

The total area planted during the season was 999 acres as compared with 969 acres in the previous season and 784 acres in 1928/29.

It will be observed from Table I that a total of 810 acres had been planted when the Ministry took possession and a further area of 5,253 acres has since been planted by the Ministry, representing approximately 9,500,000 trees.

In Table II will be found particulars of the number and species of trees planted at each centre during the season 1930/31. The species were practically all coniferae, the percentage of each species planted being as follows :—

Norway and Sitka Spruce	62.0
European and Jap. Larch	19.1
Douglas Fir	8.2
Scots and Other Pine	8.7
Others	2.0

GRANTS FOR PLANTING.

Under this scheme, whereby grants may be given to persons who undertake to plant trees on a commercial scale on their holdings, one application was received and a grant paid. In another case a grant for clearing and planting was approved and it is expected that the work will be commenced next spring.

SUPPLY OF TREES FROM THE MINISTRY'S NURSERIES.

The scheme under which farmers were supplied at reduced prices with young forest trees grown in the Ministry's Nurseries was continued. Seventy-eight persons availed themselves of the scheme and were supplied with approximately 123,000 trees, as compared with fifty-two persons supplied with 60,000 trees in the previous year.

GENERAL.

In accordance with Section 32 (1) (2) of the Irish Land Act, 1909, occupiers of holdings purchased under the Irish Land Acts must obtain the permission of the Ministry before cutting down or up-rooting trees which are necessary for the ornamentation or shelter of their holdings. During the year such permission was sought and granted in four instances.

TABLE I.

PROGRESS OF PLANTING.

Centre.	Total Area.	Area planted when Ministry took possession.	Area Planted.								Total area planted up to 30th September, 1931.
			1921–22 1922–23 1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Baronscourt	3,031	179*	678	179.5	189.25	262.5	162.3	222.5	185	167.25	2,225.3
Ballykelly .. Cam Mountain .. Springwell Mountain Drumramer .. Ballycrum .. and Leck ..	2,757	53.5	42	7.5	7	–	7.5	3	98	147	365.5‡
Castlecaldwell	303	103	87	–	13	14.5	10	6.5	1.5	3.5	239.0‡
Knockmany and Favor Royal	959	168	77	20	22	30.5	61.8	147.5	102	129.5	758.3‡
Newcastle .. Castlewellan and .. Tollymore Park ..	1,701	100	62	73	117.25	257	119.8	88	81.5	77.5	976.05‡
Hillsborough	437	–	–	–	–	–	–	60	89.75	45.5	195.25‡
Tardree and Carnearney ..	735	75†	–	–	–	–	–	113	99.5	91	378.5
Glenarm	447	96†	–	–	–	–	–	100	102.5	91.25	389.75
Rostrevor and Fathom Wood	4,139	36†	–	–	–	–	–	–	114.5	126.5	277.0‡
Ballycastle	700	–	–	–	–	–	–	44	94.5	120	258.5‡
TOTALS	15,209	810.5	946	280	348.5	564.5	361.4	784.5	968.75	999	6,063.15

* This area was under young wood when the land was acquired. Since that time 33½ acres have been cut over, thinned and underplanted.

† These areas of Tardree, Glenarm, Rostrevor and Fathom Wood were under young wood when the land was acquired. At Glenarm also an area of 12 acres of mature woods was taken over and has since been cut over by the Ministry.

‡ In addition, the following areas are under old wood, including shelter belts and scrub covered areas :—Ballykelly, 108 acres ; Castlecaldwell, 54½ acres ; Knockmany, 47 acres ; Tollymore Park, 300 acres ; Hillsborough, 110 acres ; Rostrevor, 280 acres ; Ballycastle, 30 acres.

TABLE II.

PLANTATIONS MADE DURING YEAR ENDED 30th SEPTEMBER, 1931.

Forest.	Area Planted (acres).						Species planted including replacements (thousands).						
	Afforested.		Re-afforested.		Total.		Scots and other Pines.	European and Jap Larch.	Douglas Fir.	Norway and Sitka Spruce.	Beech and other hard-woods.	Others	Total.
	Conifer.	Broad Leaved.	Conifer.	Broad Leaved.	Conifer.	Broad Leaved.							
Baronscourt	66.25	–	101	–	167.25	–	23.5	56.6	10.7	219.4	2.7	2.5	315.4
Ballykelly, Cam Mountain, Springwell Mountain, Drumramer, Ballycrum and Leck	34.75	–	12.25	–	147	–	17.3	13.6	–	218.6	.3	3.5	253.3
Castlecaldwell	–	–	3.5	–	3.5	–	2.7	–	–	4.6	1.1	1.2	9.6
Knockmany and Favor Royal	116.5	–	13	–	129.5	–	13.9	35.3	32.0	140.5	2.1	.5	224.3
Newcastle. Castlewellan and Tollymore Park	–	–	77.5	–	77.5	–	–	53.7	53.2	37.5	–	1.0	145.4
Hillsborough	21	–	21	3.5	45.5	–	2.3	8.5	40.1	26.2	6.5	1.1	84.7
Tardree and Carnearney	91	–	–	–	91	–	9.0	–	–	153.7	–	.2	162.9
Glenarm	91.25	–	–	–	91.25	–	–	90.3	4.2	61.8	4.2	2.1	162.6
Rostrevor and Fathom Wood	53.5	–	73	–	126.5	–	62.8	83.5	4.5	73	6.5	–	230.3
Ballycastle	120	–	–	–	120	–	21.4	–	–	160.8	–	–	182.2
TOTALS	694.25	–	301.25	3.5	999	–	152.9	341.5	144.7	1,096.1	23.4	12.1	1,770.7